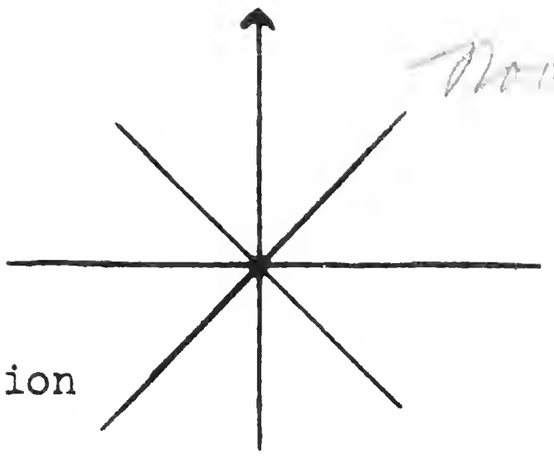
Noon - 4°32'S - 82°05'W



Ship Direction

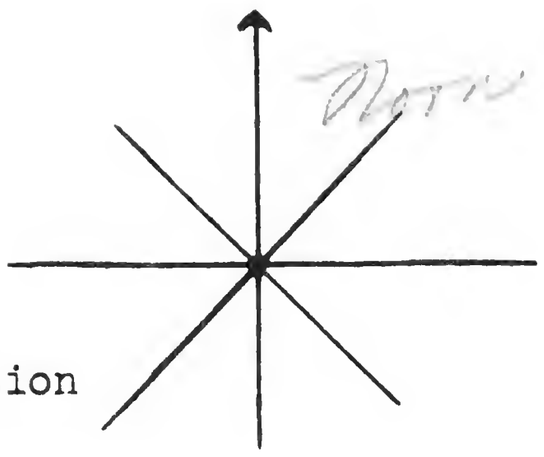
OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 10 AUG 67
Pg.#

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0900-1800					1000's of pilot whales seen throughout day - from ship to horizon in all directions.
	Wilson's S.P.	200	Rel 3		flying about surface particularly in wake.
	Cape Pigeon (Daption capense)	10			flying about ship & in wake.
	?	1			small grey bird - med. size - black wing bars
	Cape Pigeons	20			(throughout day 1 or 2 - 5 in a group)
	(Sooty S.P. ~~Hawkbury S.P.~~ O. markhami	2			
	Hawkbys S.P.	1			
	Wilsons	2			
	Gadfly type Petrel Sooty Shearwater	2	Rel 3		more probably Sooty Shearwater maybe Kermadec Petrel ? sitting on surface - flying off as ship approached.
	Sula variegata	5	E-SE		individuals
	Terns	2	N.W.		unid. - one gray upperparts, white under; black capped ? and; other dk w/ white forehead upper sidewings
	Brown Boobies	15			Group porpoises 600 yds off stern moving S.E.
	(260)				

5 HR OBS



Ship Direction

Plotted 07°34'S - 81°59'W

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

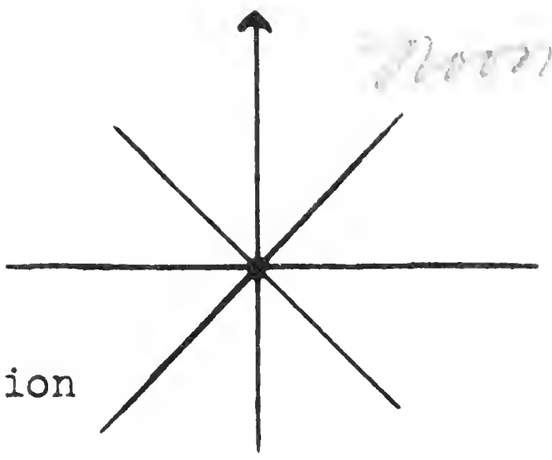
Date 11 AUG 67
Pg.#

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
0900-1300	0.Tor Kys Rel }				
	Leach's SP }	40	-		in wake or near ship - (25-200 yd)
	Wilson's SP }				
	~~GADFLY~~ Sooty Shearwater	10	Rel		~~KERMADEC~~ ? SOOTY SHEARWATER
	~~PETRELS~~				
	Cape Pigeon	15	-		flying about ship - especially in wake.

2 HRS OBS

(65)

Noon 10°04'S – 81°53'W



Ship Direction

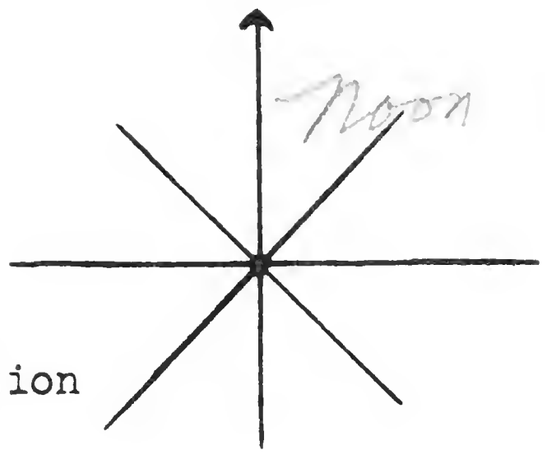
SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 12 AUG 67
Pg.#

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
1000	Cape Pigeon	5			on surface & in wake
1000-1015	~~teachis~~ &/or Wilson's S.P.	10	Rel 3		in wake & about surface
1100	Dark GADFLY Petrel SOOTY SHEARWATER KERMADEC ?	2	S-SE		flying several hundred yards off
	Hornby's S.P.	3			flying about low
	Bird	2			large white bellied - too far off to identify.
		(22)			

2 HR OBS



Noon 07°32S - 79°34W

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 13 AUG 67
Pg.#

TIME	SPECIES	#	SPECIMEN or DIR.	BAND NO.	REMARKS
0400	Cook's Pet	1			large grey-white; dark wings & Petrel caught on deck --- Cook's Petrel --- flying about ship.
0900	Wilson's S.P. ?	5	Rel 3		" " "
	Sooty Shearwater	1	Rel 3		
1200	Brown Booby	1'0	S		
	Wilson's ? S.P. & Sooty Shearwaters ~~about~~ seen throughout day 10 total 5 total				
	32				2 HICS OBS

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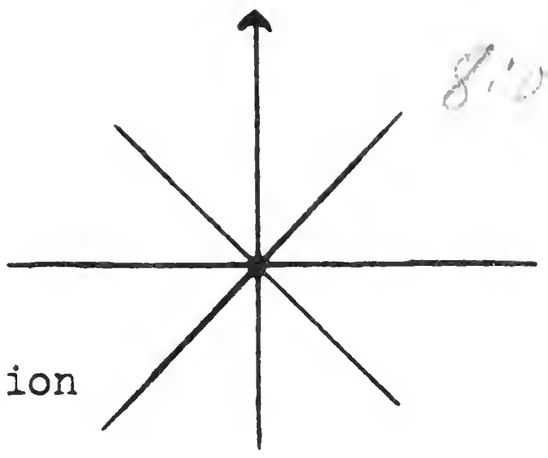

Ship Direction

8:00 — 12°02'S - 77°15'W

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 14-15 AUG 67

Pg. #

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
	In Callao Harbor				
	Common species				Not on ADP sheets
	Peruvian Booby				
	Laughing or Franklin's Gull				
	Wilson's S.P.				
	Sooty Shearwater				
	Chilean Pelicans				

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Noon - 12°17'S - 77°30W

OBSERVERS:

Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

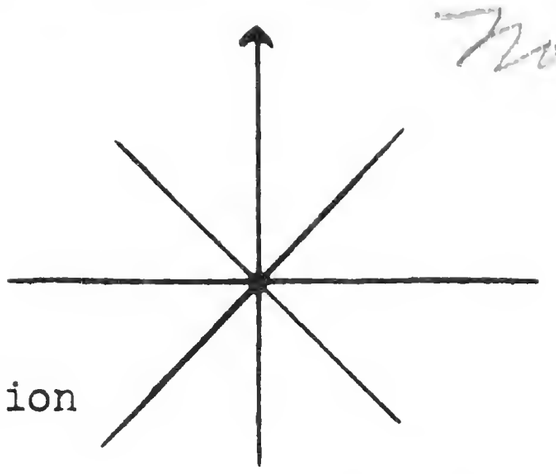
Date 16 AUG 67
Pg.#

TIME	SPECIES	#	moving DIR.	SPECIMEN or BAND NO.	REMARKS
	departed Callao - 1300				
1300-1330	on way to Sta 4	7124			
	Sooty Shearwater	75-100	S-SW	Rel 3	
	Gulls (Kittiwakes)	35	S-SW		
	(Franklin's or hanging) Gulls	20	-		following ship SW.
Rel 3	Wilson's S.P.	30	-		fluttering about surface
	Cape Pigeon	5			
	Terns -	10	→S,SE		common - but unidentified
1430-1445	Peruvian Booby	1	→SE		
	(Fulmer type)	1	→NE		flew low over water - had to rise to fly over low then descended once again
	Sheat-Pet Terns	10	-		unid. all blackcapped, gray above, white below - indiv. & in groups of 2 or 3

(167-192)

2 HR. OBS

Noon 12°59'S — 78°32'W



Ship Direction

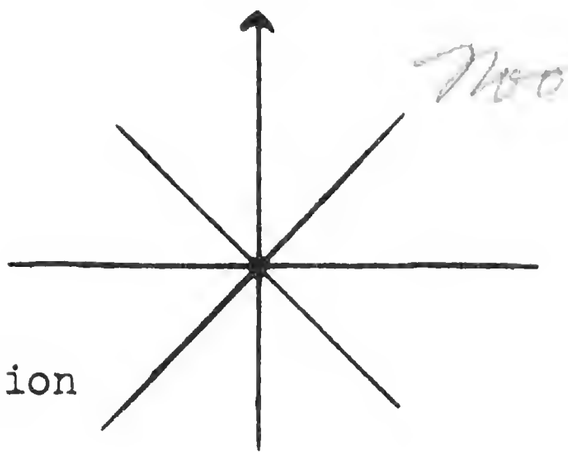
OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 17 AUG 67
Pg.#

TIME	SPECIES	#	SPECIMEN or DIR. BAND NO.	REMARKS
0630	Wilson's SP.	10	Port 3	about ship
				school of porpoise moving SE
1200	Wilson's	15	Port 3	off stern
	Sooty Shearwaters	5	Port 3	flying about surface 200 300 yds off stern
	Cape Pigeons	3		"
				2½ HRS OBS
				C

33



Ship Direction

Noon - 14°04'S - 82°43'W

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 18 AUG 67
Pg.#

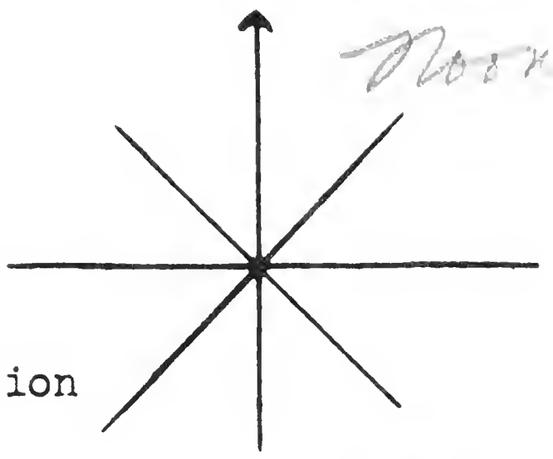
TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
1050-1100	(Wilson's	2	Rel	3	
1315	Bulwer's		D. macdonnelli		Rel 3
	or Sooty SP?	1	S		
	Cape Pigeon	1			
	(Leach's SP)	1	E, SE?		flew past stern — E, S.E.
	Oceanodroma				dingle from S, S.E.
	(5)				

1½ HRS OBS

Noon 14°#35-85°01 W

OBSERVERS:

Ship Direction



SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

+6 Z Time Local

Date 19 AUG 67
Pg.#

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0400	Cape Pigeon	1			flew in acc of platform light
0910	(Bulwer's or Sooty)	1	NE	O. markhami Rel 3	Sta 47151 - flying along swells.
0950	Cape Pigeon	1			
	(Sooty S.P.)	1		O. markhami Rel 3	
	White Bellied Storm Petrel	1		Rel. 3	
1000	Wilson's S. P.	1		Rel 3	from NW
1115	Cape Pigeon	3			Heading due North on 85 Parallel
	White Belly S.P.	1		Rel 3	
	Wilson's? (Leach's?)	1		Rel 3	
		10			5 HRS OBS

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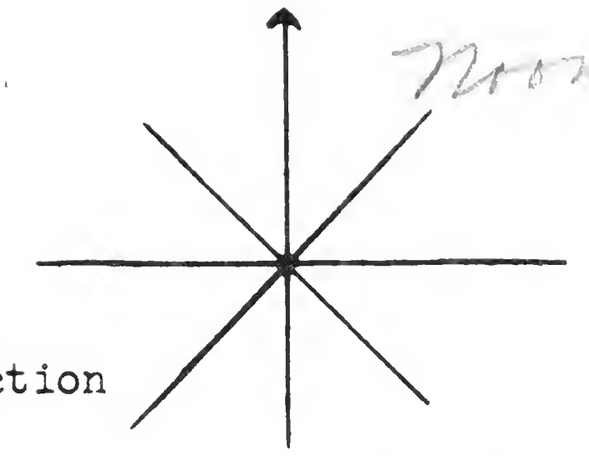
Now = 14°43'S — 85°W

Ship Direction



OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 20 AUG 67
Pg.#

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0930	Leach's	10		Oceanodroma	about ~~water~~ around ship
	(Sooty SP)	1			
	O. markhami			Rel 3	
1100	Leach's	10			in wake
1130	Cape Pigeon	1			Mola Mola - ocean sunfish (3')
1535		(1			
	Wilson's	1	Rel 3		
1530	Leach's	5			off to West.
1600	SP.			Oceanodroma	
1600	Leach's	8			in wake & about ship.
1630	Sooty SP.	1		O. markhami	off bow
				Rel 3	
	White Belly S.P.	1	E	Rel 3	
		39			

5 HR. OBS

Noon - 9°03'S - 85°08'W

OBSERVERS:

Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 21 AUG 67
Pg.#

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
0645-0730	Albatross P. cellaroides	2	N		flew up from 1-2 mi astern I flew around ship then S. - finally sat behind. totally dark brown - with yellow cream bill.
	Pintado Petrel	5			
	Wilson's	1			
	(Leach's)	5		Oceanodroma	
	White Belly SP	1		?	medium to large, grey upper, white under,
	Hornby Petrel	1			
1100-1130	(Leach's)	10		Oceanodroma	
	Pintado Petrel (Cape Pigeon)	3			in wake
1415	(Leach's SP)	11		Oceanodroma	in wake
	Cape Pigeon	2			

41

3 HR OBS

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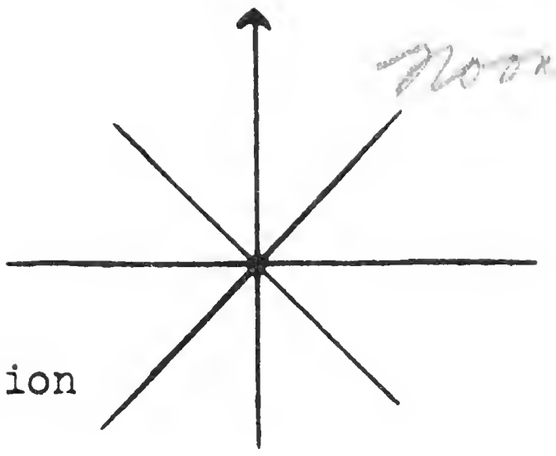
Noon 6°17'S - 85°25'W



Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 22 AUG 67
Pg.#

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0700-0720	Leach's S.P.	10			Oceanodroma
	Cape Pigeon	1			
	White Belly S.P.	2			Red 3
	Petrel	1			like Sooty S.P. too far off to identify
					Oceanodroma
1000-1130	Leach's	5			STA. 47177
	Cape Pigeon	3			
	White belly S.P.	2			Red 3

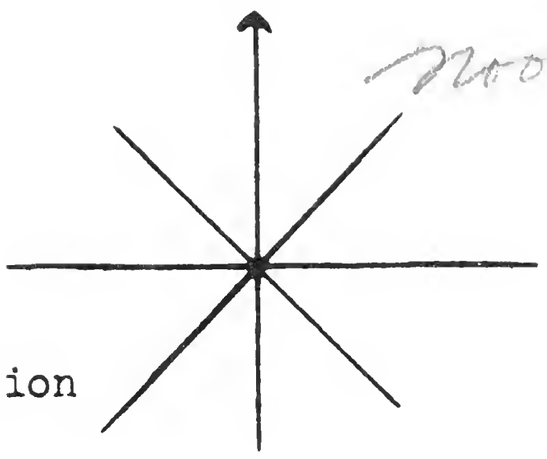
19

21

1 HR OBS

Noon 03°43S – 85°01'W

OBSERVERS:



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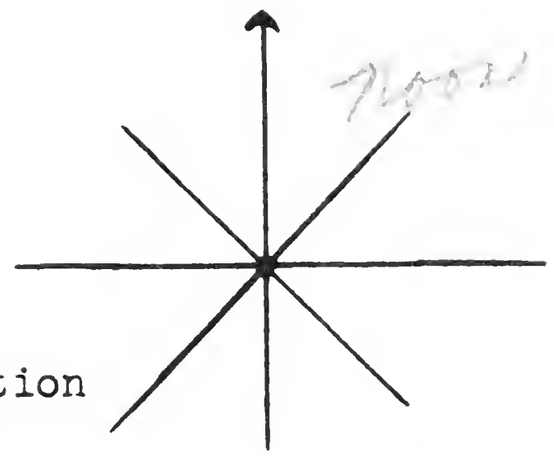
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 23 AUG 67
Pg.#

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
0930-1130	Wilson's S.P.	15			STA. 47189
	(Leach's)	25			Oceanodroma
	Cape Pigeon	1			
	(Sooty S.P.	2			O. macdonaldi ?63
	Hornby S.P.)	2			Pel 3
1400-1430					
	Cape Pigeon	5			
	~~Leach's~~ Wilson's	> 15			
	Albatross	1			1-2 mi away flying S.
1515-1530	~~Northern~~ Phalaropes	9	→	E	5-10 feet above water flying W-D E off bow - acted like flycatcher in pursuit of insects - arching twisted - quick turning flight
	Hornby	1			
		(16)			

3 HR OBS

Ship Direction



~~Noon~~ 0°32'S - 85°04'W

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

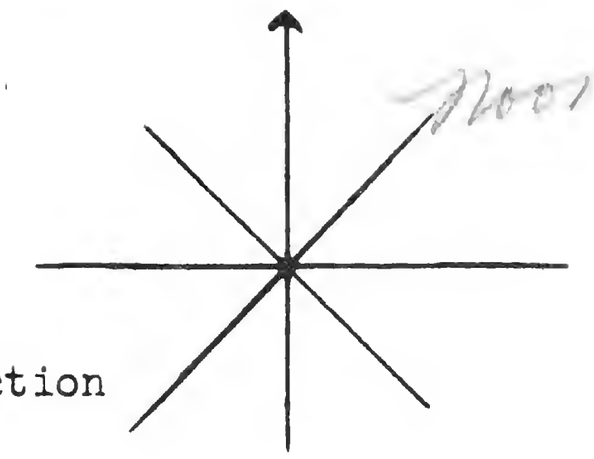
Date 24 AUG 1967
Pg.#

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
0545					misty type rain - heavy overcast
~~0600~~	Wilson's or Leach's S.P.	1	SE	Oceanodroma	Shearwater type seemed to be chasing it Northward - 300 yds off
0700 0710	(Leach's SP)	1		Oceanodroma	
0950	Leach's	1	NW	Oceanodroma	
1015	Frigate Bird Lesser? (?)	1	S, SW.		came from NW then circled above ship.
1020	Leach's	2		Oceanodroma	immature plan & circled over them
1100	Frigate Bird	1			Soaring off to W. then over ship
1550	Frigate Bird	1			

8

2½ HR. OBS

Noon - 2°17N - 84°57W



Ship Direction

OBSERVERS:

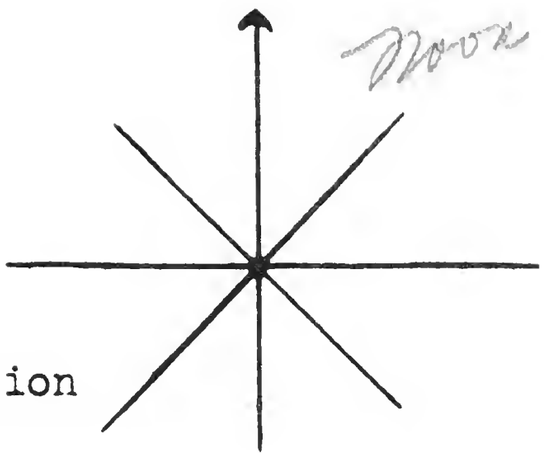
SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 25 AUG 67
Pg.#

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0655-0710	Frigate Bird	8			~~Time there~~, to. off to W. soaring after chasing each other - diving to surface & flying Immature, 1 adult soaring & flying together.
	Red footed Boobies	8	NE→SW		
	Storm Petrel	1			unid. - in sun.
0930	Frigate Birds	11	SE		soaring - one dove into sea
1015-1040	Frigate Birds	4	SW		high - too far to identify
		2	→SE		1 ♂ Great F.B. other ♀ Great flew across bow.
1300	Leach's	5			accompanying wake
1450	Leach's	1			
		(40)			

2 HR OBS

Noon 5°15N - 84°46W



SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 26 AUG 67
Pg. #

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0545	Frigate Bird	1			soaring off to E.
0510-0530					school of Dolphin fish feeding on flying fish in platform light.
		2			6-8' Silky Sharks, Carcharinus longimanus
1030-1115					8 Dolphin fish caught off stern.
					indivi seen every 30 often throughout day.
	(Leach's SP	10			
	O. Tethys	Rel 3			1 shark caught during night.
		(11)			

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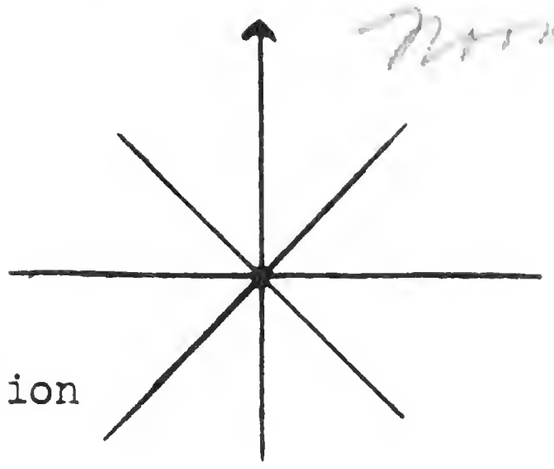
Now 07°32N - 85°04'W



Ship Direction

OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 27 AUG 67
Pg.#

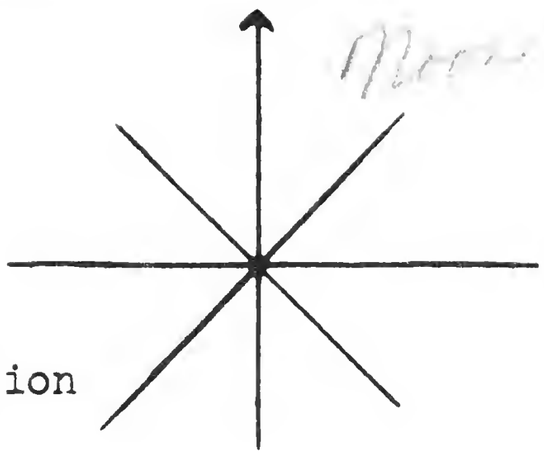
TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
0645	Storm Petrels Wilson's or Leach's	2			
	Brown Booby	1	E to W		
0845	Sanderling or Sandpiper	1			dead - floated by ship.
0850	Shoreland				school of skipjack tuna seen off to west; Green Turtle swam up to ship from 210°T then away to 280°-290°T in wake
0915	Leach's S.P.	25			200-300 yds SE. of ship
	Brown Booby	3			Skipjack Tuna off to West
0945	Brown Booby	1	to W		
1000-1045	(Leach's? S.P.)	200±25			floating in dense group on surface, some flying occasionally. When ship closed them - they scattered & disappeared.
	O. tethys	1			
1110		1			Marlin jumped 1 mi. S. of ship
1530-1545		1			Shark swam around vessel
	Snowy Egret	1	NE		came in from NE - circled ship then flew NE.
		1	small		green turtle passed ship
	Dark Boobies	2	to E, NE		each alone just above surface

230

4 HR OBS

Noon 09°47N – 84°45W

OBSERVERS:



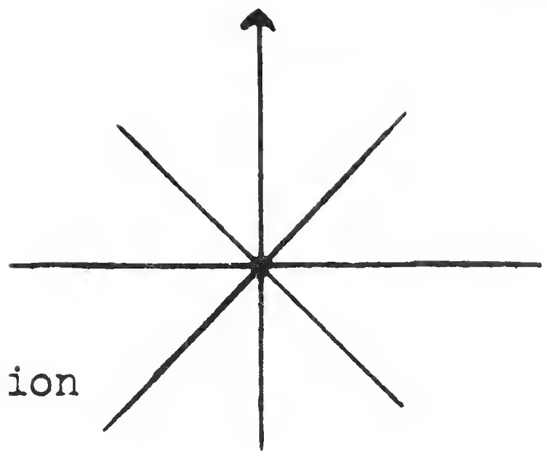
SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 28 AUG 67
Pg.#

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
					At sunrise in sight of Costa Rica – off Puntarenas.
	2 Spectled Dolphin				off bow
	Brown Boobies				
	Frigate Birds common				
0700	"Raft" of storm petrels seen – 100 ±00 in group on surface.				
	Pelicans				

No MPP

1½ HRS OBS



Ship
Direction

OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 30 AUG 67
Pg.#

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
					left Puntarenas - no obs.

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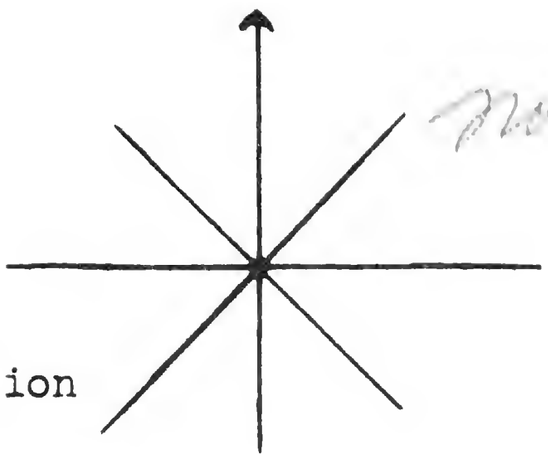
Noon 11°56N - 31°20W

Ship Direction



OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 31 AUG 67
Pg.#

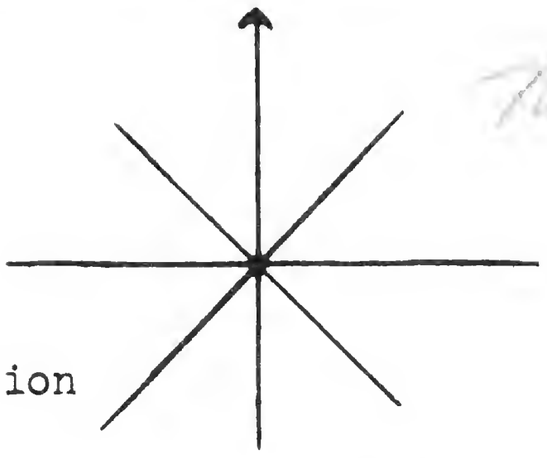
TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0630-0715	Sooty S.P	4			in wake
0800	Sooty S.P	3			" "
	Leach's S.P.	1			" "
0815-0900	(Sooty S.P. 10 Blk. S.P		Rel	3	" " (probably those above at 0800 are some of same)
0830	Phalaropes	2			landing and taking off for water off to West.
1130-1230	FLYCATCHER	3			Wood Peewee or more likely Phoebe type. flying about ship & landing one caught - had tick on underside of bill - released - couldn't I.D.
1215	~~Sanderlings~~ Phalaropes	2	→ E		
1230	(Leach's S.P.	1	Rel	3	in wake
	Sooty S.P.	8			" "
	Blk. S.P		Rel	3	

5½ HR. OBS

34

Noon 09°45 N - 88°13 W

OBSERVERS:



SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 1 SEPT 67
Pg.#

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
0700	Flycatcher	1			flying about ship
0930	(Sooty Tern	10		Rel 3	
	SP	10		Rel 3	in distance
	(Sooty SP?	2			
1345	Red Footed Boobies	3	→W, SW		flew close by ship
	(Wilson's or Leach's SP	15			
1430	Phalarope	1			flew about ship then settled in water off to west - drifted off.
1435	Blue Footed Booby	1	→E, NE		
	Red Footed	4			
	(Sooty SP	10			common about surface of sea
	(Leach's SP)	15			
1500-1600	Green Turtles	&			ranging from 1-3 feet - two copulating - drifted by →N
1720	(Leach's SP.	25			as we went S. most headed →N
	Red Footed Boobies	2			common about vessel
					float alongside to west and move aft then fly in pairs.

5 HR. OBS

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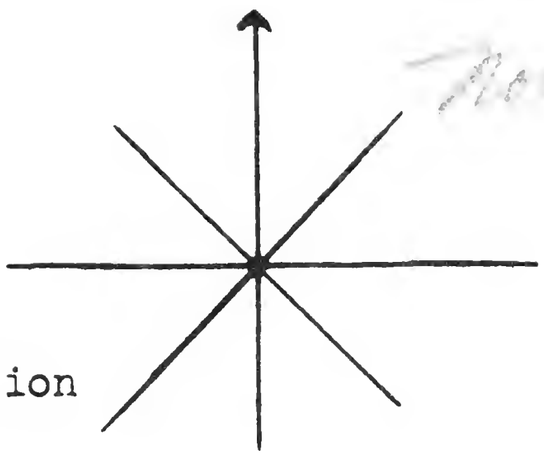
Noon 6°47N - 87°37W

OBSERVERS:



Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 2 SEPT ~~AUG~~ 67

Pg.#

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0615-0630	Brown Booby	1			flew around ship ¼ mi back in wake
	(Sooty? SP)	1			
1130-1200	Red Footed Booby	2	→ NW		
	(Sooty SP)	1			in wake
	(Leach's SP	5			" "
1200-1300	Shallow	1			flying S. with ship - landed aboard - then flew off alternately
1415	"	2			" "

2½ HR OBS

(13)

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Rev. 5-66

Ship Direction

05°04N - 87°25

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 3 ~~AUG~~ SEPT 67

Pg. #

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
					Cocos Is.
					Throughout day - at Chatham Bay
					Red footed Boobies: seen to leave the island at sunrise
					0400 - 0700 → N to W - 500 - 1000 ± a couple
					thousand. One caught on ship during night
					May have been Brown Boobies also but
					overcast & low light level made ID difficult
					in early hours.
					♀ Great Frigate Birds in thousands - only
					10 - 20 ♂ Frigates seen during day.
					White (Fairy) terns common - in trees & bushes
					(trees alone) inland
					Common Noddy also common on rocks - just
					off shore (20 - 100 yds) & flying about
					on shore Whimbrel; Sandpipers sp
					bird no ID attempted.
					collected 2 Frigate Birds, 3 Common Noddy,
					1 Fairy Tern with shot gun -
					most in poor condition
					1 Brown Booby shot from tree
					disappeared in very brush to
					ship.

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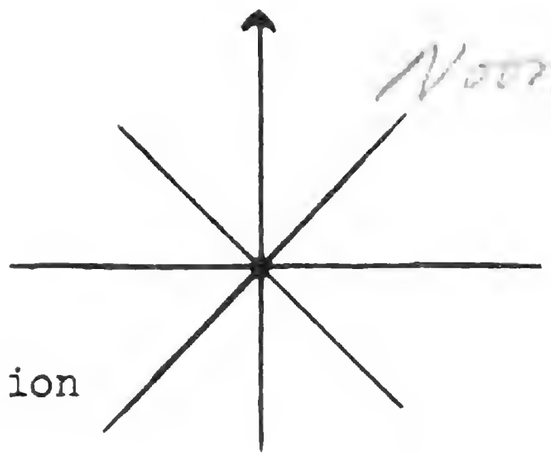
Rev. 5-66

Noon 3°15N – 85°04'W



SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

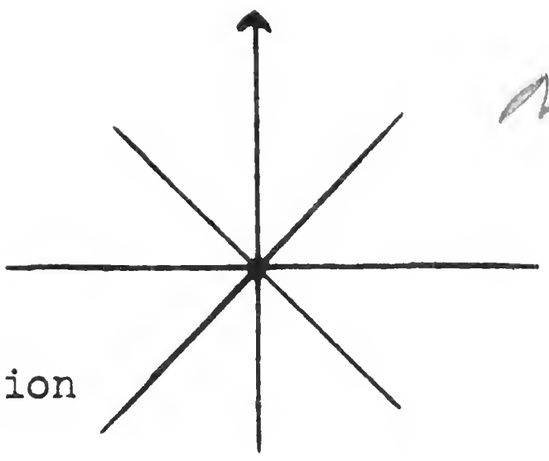
Date 4 SEPT

Pg.#

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
0630	Frigate Birds	3			) Jaegers & Frigates in feeding flock - circling - Frigate - high. Boobies in separate group - circle during - to East
	Red Footed Boobies	6			
	Jaegers, Parasitic?	10-15			
0645	Frigates	2			
	Red footed Boobies	7			
	Jaegers	10			) 2nd group of birds circling & feeding to East
0930	(Leach's S.P.)	1	→ N		soaring - high - 1-2 min off to west
	Frigate B.	1			
1030	Red Footed Booby	1	→ N		
1040	Frigate B.	1	→ NE		♀ Great
1110	(Leach's S.P.)	1			
	Shearwater wedgetail?	Red 3	→ NW-N		arching over surface: dark except for white belly & white mid-stripe underside wings; neck sides brown, ~~flight~~ underside neck white
1155	Frigate B.	3	→ NE		1 ♀ Great; 2 ♂ - followed ship south then flew off to NE. 4th Frigate joined up
1215		1			
1215	Red Footed Booby	1	→ E		all white bird glimpsed disappeared in waves.
	?	1			
	(Booby S.P.	1	S → N → NW	Red 3	
1400	Frigate B.	3			
	Red footed Boobies	3			
1415	Red footed Boobies	2			off in distance ½-1 mile

(49)

6 HR OBS



Ship Direction

N of 7° 22' N - 85° 02' W

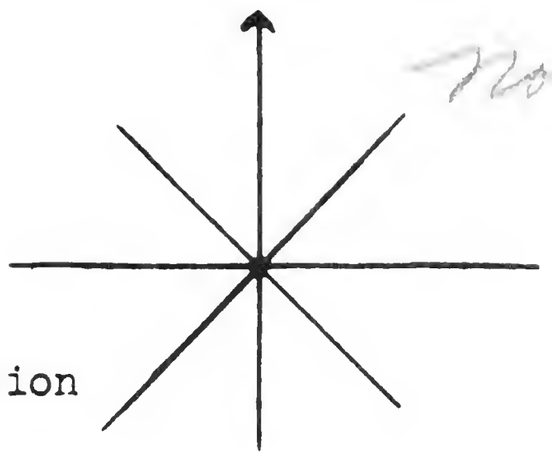
SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 5 SEPT 67
Pg.#

TIME	SPECIES	#	SPECIMEN or DIR. BAND NO.	REMARKS
	Red Footed Booby (1 adult M)			night on deck during night
0930	Shearwater Wedgetail? 1	Rel 3 SW		like one seen on 4th
1130	(Leach's SP) Oceanodroma	2		off stern
		(4)		

1 HR OBS



Ship Direction

From 02°31'S — 88°02'W

OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 6 SEPT 67
Pg.#

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
0710-0730	(Sooty SP.	1	→S		P. mandtiana ??
	(Leach's SP.	1	→S		Oceanodroma
	Shearwater wedgetail?	1	→S		??
	Cape Pigeon	1	→S		
	Northern Phalaropes	2	→S		
0800	Northern? Phalaropes	2	→S		

8

½ HR OBS

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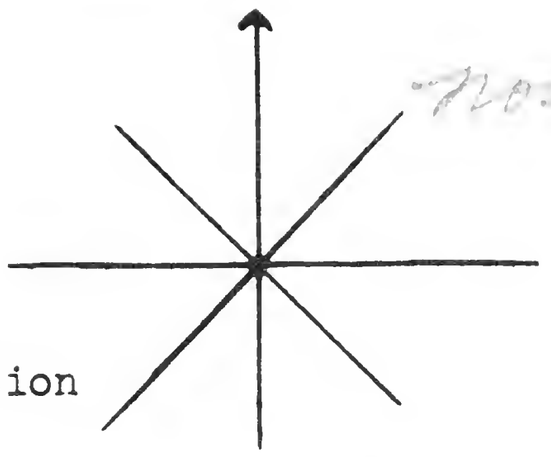

Ship Direction

72.0°W - 05°15' - 88°33'W

OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 7 SEPT 67
Pg.#

TIME	SPECIES	#	SPECIMEN or DIR.	BAND NO.	REMARKS
0930	(Sooty SP)	1	Pterodroma		
	(Leach's SP)	2	Oceanodroma		
0945	Hornby's SP	2			
	Storm Petrel				
1000-1040	Cape Pigeon	3			on STATION 47349, school Pilot whales came up to vessel, swam around for about 1-½ HR.
	(Leach's SP)	4	Oceanodroma		
	Hornby's SP	1			
	Storm Petrel				
1145	(Leach's)	15			
	Oceanodroma				
		(20)			

2 HR OBS

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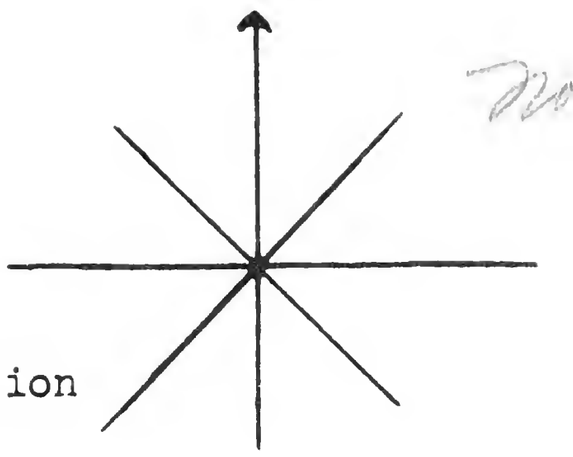


Ship Direction

Norm 8°16'S - 88°03'W

OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

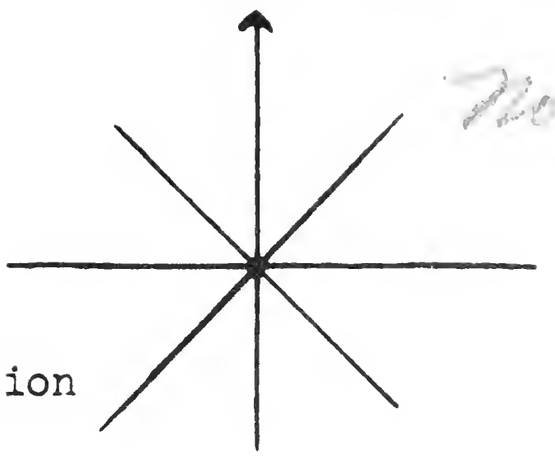
Date 8 SEPT 67
Pg. #

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
0650	Hornby's SP.	1	→ N		
	Leach's SP.	1	→ N		
	Oceanodroma				
0930	Cape Pigeon	1			off fantail
	Leach's SP.	10			" "
	Oceanodroma				
1100	Cape Pigeon	1			" "
	(Leach's SP.)	10			" "
	Oceanodroma				
		(24)			

1½ HR OBS

Noon - 11°45-87°57W

Ship Direction



OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 9 SEPT 67
Pg.#

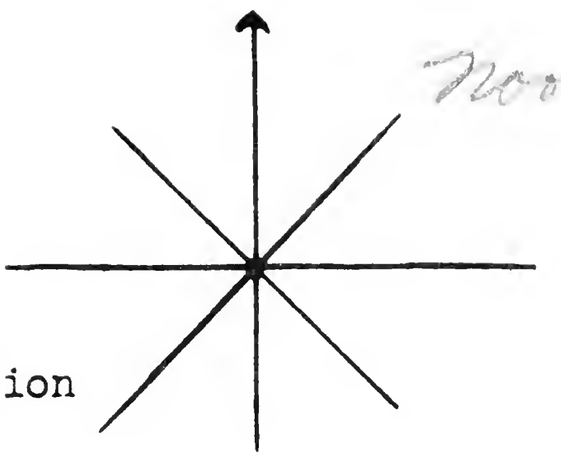
TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
0615	Sooty or Bulwers?	1	→SW		too far away to IDEN.
0640	Hornby's sp?	1		Specimen retrieved	landed near wake
0900	Cape Pigeon	1			landed to west
1030	Cape Pigeon	1			maybe same as above - sta 47369
1100	Pilot Whales	20±5			to North

4

2 HR OBS

Noon 14°02'S - 87°57'W

OBSERVERS:



SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 10 SEPT 67
Pg.#

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
1000	Cape Pigeon	1			
1355	Bulwers or Sooty S.P.	1	→S-SE.		STRONG WINDS
	Oceanodroma	(2)			½ HR. OBS

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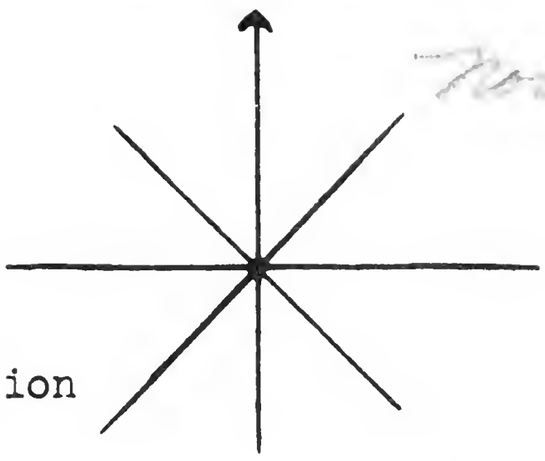
Rev. 5-66

Noon 14°57'S - 91°40'W



Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 11 SEPT. 67
Pg.#

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
1400	White Throated SP.	1 Rd 3	→ E		~~HIGH~~ 35 KNOT WINDS
					NO OBS

(1)

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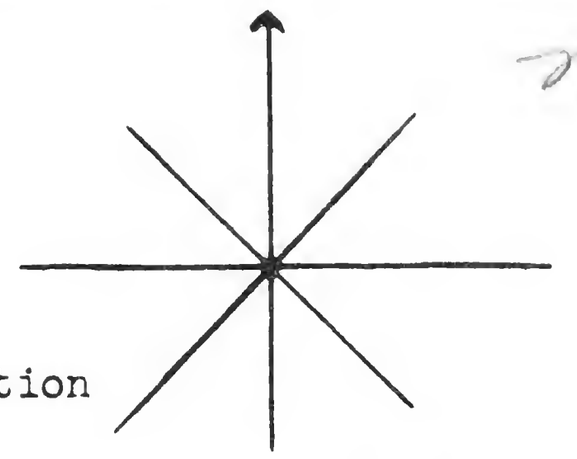
Rev. 5-66

Noon 14°16'S - 25°07'W



Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 12 SEPT 67
Pg.#

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
1030	IMMATURE Booby ~~species~~ BLUE FACED	1			landed on sea, flew about ship
1100	Cape Pigeon	2	+BN		off stern
					½ HR
		(3)			

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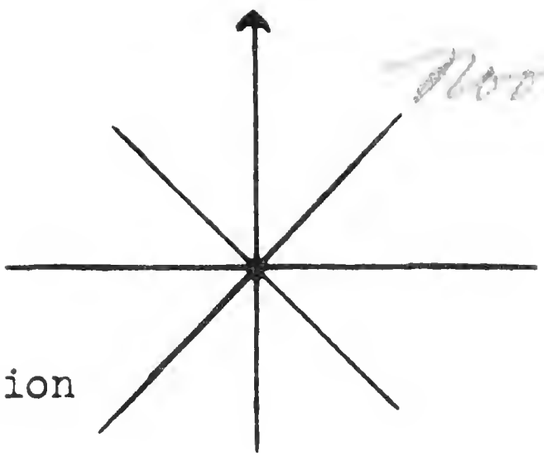
Rev. 5-66

Noon 10°45'S - 95°03'W



Ship Direction

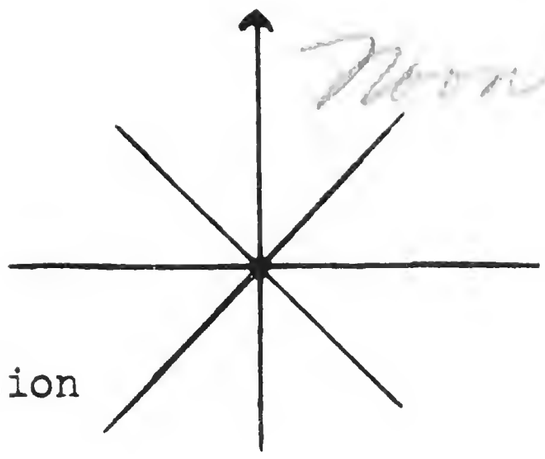
OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 13 SEPT 67
Pg.#

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
1000	Cape Pigeon	2			
	(Sooty S.P. or Bulwers	1			200 yd out off stern
	Oceanodroma	(3)			½ HR OBS

Noon 07°32S - 25°00W



Ship Direction

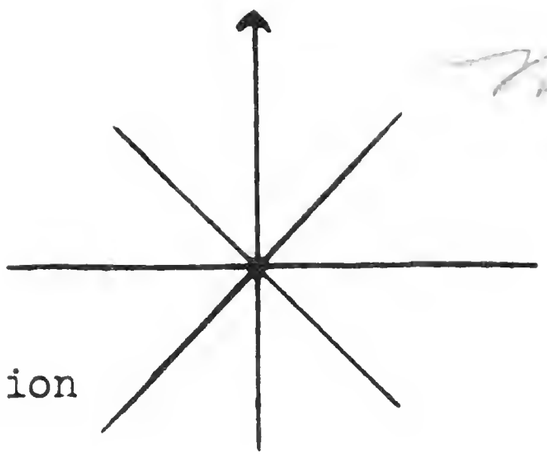
SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 14 SEPT 67
Pg.#

TIME	SPECIES	#	SPECIMEN or DIR.	BAND NO.	REMARKS
0845	Frigate Bird	1			slowly circling to North
0910	Wedgetail?				
	Shearwater	1	-DN	R03	
					1½ HR OBS
		(2)			

Noon 8°45'S - 85°01'W



Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

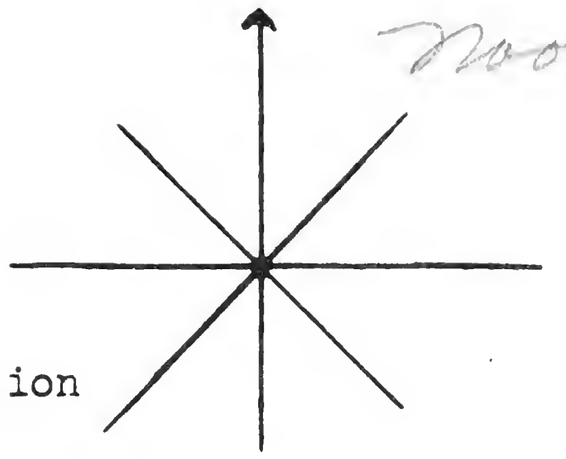
Date 15 SEPT 67
Pg.#

TIME	SPECIES	#	SPECIMEN or DIR.	BAND NO.	REMARKS
0830	Cape Pigeon	1			
1300	(Hornby's SP.	1	S		Petrel
	Leach's SP.	1			Oceanodroma
1320	Sooty S.P. or Bulwer's	1	S		
		(4)			Oceanodroma

2½ HR OBS

Noon 25°51'S - 95°08'W

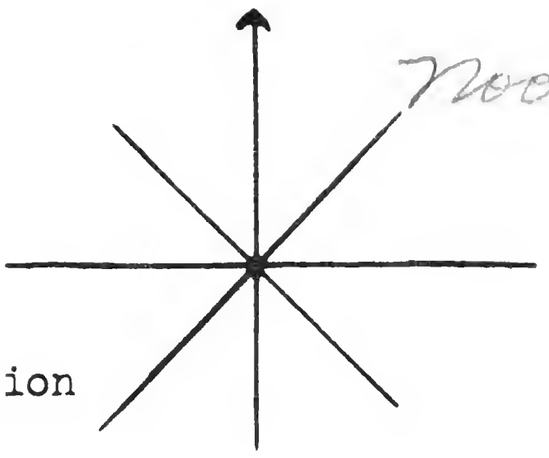
OBSERVERS:



SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 16 SEPT 67
Pg.#

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
0800	FRIGATE B.	1			Hovering 5-10' over water - as if watching school of fish.
0915	Wedgetail? Sheanwater	1	→ S	P.O.3	
1410	Hornby's S.P.	2			flying in small circles - one dipping bill in water then flying a few yards dipping bill - etc 6 or 7 times
1600	Hornby's S.P. Dicm. Petrel	1			dipping bill as above - "walked" on surface -
1630	Leach's S.P. Oceanodroma	10			~~alone~~ flying randomly about surface.
		(6)			2 HR OBS



Ship Direction

noon 02°31'S - 95°01'W

OBSERVERS:

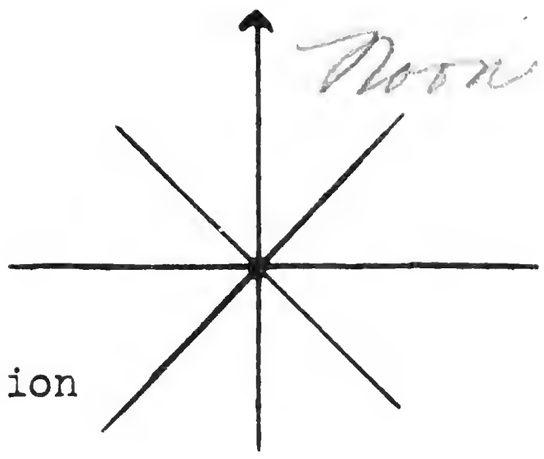
SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 17 SEPT 67
Pg.#

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0930	Leach's S.P.	3			
	Cape Pigeon	1			
1125	" "	1			
	Leach's S.P.	5			
	Booby	1	N, NE		to far off to IDEN.
1240	Sooty SP.	2			on surface - into air
	Leach's SP	3			on surface
	Northern Phalaropes	3 2 OBS 1	circling		"dropped out of sky" 10-15 feet to land on water.

19

2 HR OBS



Ship Direction

Noon 0°23'N - 95°06W

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 13 SEPT 67
Pg.#

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
0630	Leach's SP.	1			Oceanodroma
0815	Leach's SP.	2			
1030	Leach's SP.	5			STA. 47474
	GULL	1	→SE		
	Tern (Large Crested or Caspian or Royal)	1	→E		deeply forked tail, black cap, grey upperside of wings; white underside
1410	Leach's SP. Oceanodroma	2	E→W		
	Petrel	3			size of sooty SP - heavier body; strong rapid wing beats, dark rump, dark above, white below, Petrel like - BONIN'S except base of bill - forehead appeared dark.
		(15)			

1½ HR OBS

Noon 3°25'N-87°W

OBSERVERS:

Ship Direction

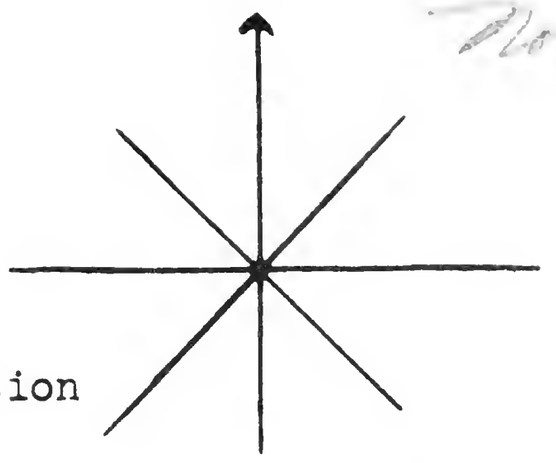
SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 19 SEPT 67
Pg.#

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0800-1000	Leach's SP.	10-15			passed in dirs & groups of 2-3.
1215-1220	Frigate Birds	100 ± 10			feeding flock; most of Great F.B. a few of the Frigates were chasing some of the Red footed Boobies.
	Red Footed Boobies	50-60			2 groups of Boobies in water 20-30 in each - only a few were flying about 10-15 Boobies in light phase.
1235	Shearwaters (Wedgetail)?!	2	→ SE		then landed; underside of wing white outer part - inner ½ with white diagonal stripe rest of body dark
	Hornby's SP	1	→ SE		
1705	Shearwaters	2			dark in color - no lines - looked like above through ≈ 200yds off
1730	Red footed Boobies	6	→ W		
		171-186			3½ HRS OBS

Noon 6°34'N - 94°52'W

OBSERVERS:



SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 20 SEPT 67
Pg.#

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
0600	FRIGATE BIRD	1			soaring overhead
1000	WARBLER	1	→E		
1000-1200	Leach's S.P.	5			indivi seen occasionally
	Occasional				
1150	Tern sp.	1	→S		
	Occasional				
1600	Leach's S.P.	2			
	Shearwater	1	→N		MAYBE NEW ZEALAND
1820	(HOWBY's S.P.)	2	→S-SW		Petrel
	Shearwater	1			MAYBE NEW ZEALAND
	(14)				

3¼ HR OBS

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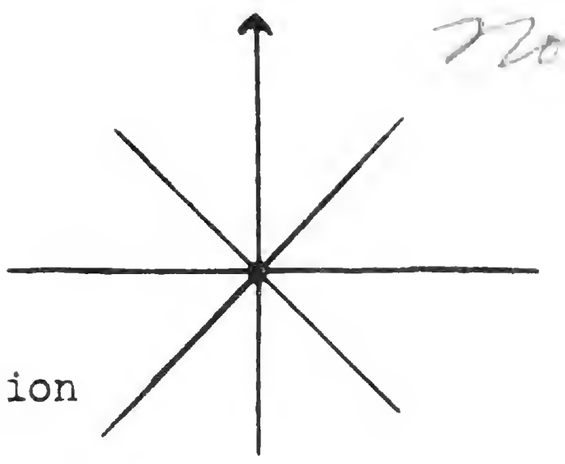
Noon 10° 21'N - 75° 04'W



Ship Direction

OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 21 SEPT 67
Pg.#

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0800-	~~E~~				
1000	(Leach's SP	15			~~Cuban~~ indiv - when stopped grouped up off stern STA 47573
0900	SOOTY SP	1			
0920	FLYCATCHER	2	→SE		in wake ~~landed~~ circled & then off to SE. (EASTERN KINGBIRD)
1020	NORTHERN PHALAROPE	1	→N, NE		
		5	→E		FLYING ABOUT 30-50 ft off water
		2	→SW		
1120	BLUE FACED BOOBY	1	→N		ADULT, 102 ft Hawaiter
1125	School of MACKEREL				surface feeding
1325	(Leach's SP	2	→S		
	2 Cory's Shearwaters				
	School of fish				feeding on surface
1335	NORTHERN PHALAROPE	1	→S, SE		flew over ship; have heard the same "chirping sound" before - but have not seen birds, - also heard it at times during night.
1345	BLUE FACED BOOBY	1	→S, SE		
1400	RED FOOTED BOOBY	1	→SSE		flew over ship; circled 2 times
1435	NORTHERN PHALAROPES	9	→NW		one group w/ 5; two w/ 2, STA. 47515
	TERN, LEAST?	1	NW→SW		mackerel? feeding; flew circled - dove into water 10 to 12 times - circled flew off to SE. 1500 Tern back again feeding.
	Red Footed Booby	1	→SW		
1500	~~NORTHERN~~ PHALAROPE	2			1 on surface, 1 flying about
	SOOTY SP?	1			
	(Leachs)	12			(61)
1535	School of fish				surface feeding
	Tern	1	→S		5 HP's OBS
	BLUE FACED BOOBY	1	→NW		
1845	BROWN BOOBY	1			ATTEMPTED TO LAND ON FOREMAST

Noon 13°34N-78°21W

Ship Direction

OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 22 SEPT 67
Pg. #

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0600	BROWN BOOBY	1			ON FOREMAST ABOVE RADAR ; STAYED THERE OVERNIGHT?
0645	BROWN "	2			flew around ship - one on mast joined them.
0710	BROWN "	8			
0730	NORTHERN PHALAROPES	45			flying about & sitting on water
0810	BOOBY	1			White - too far off to IDEN.
	STORM PETREL	1			like Leachi's except no white rump completely dark.
	school of fish	(3)			(Skipjack Tuna?) jumping 200-300 yds. in wake
1045	(Leach's S.P.) Dark rumped	1			
	BLUE FACED BOOBY	1			
	(SOOTY) S.P. Black Rump	1	→	S, SE	
1145	BLUE FACED BOOBY	1	→	S, SW	
	MARLIN	1			
	GREEN TURTLE	1			
	BROWN BOOBY	4	→	SE	
1230	BROWN BOOBY	5			
1300	(SANDPIPER) Phalarope	1	→	NW	flew around ship 3 times then NW
1330	BLUE FACED BOOBY	1	→	N, NE	
1335	" "	3	→	E	FISHING BUOYS - LONGLINERS ? SIGHTED
1500-1700	" "	10	→	S	GROUPS of 2, 3 & 4 each
1815	(DUNLIN? SANDPIPER) Phalarope	1			like sandpiper flew under ship - then up to surface, flew up - then back to surface.

87

5 HR OBS

Noon 13°54'N - 71°35'W

OBSERVERS:

Ship Direction

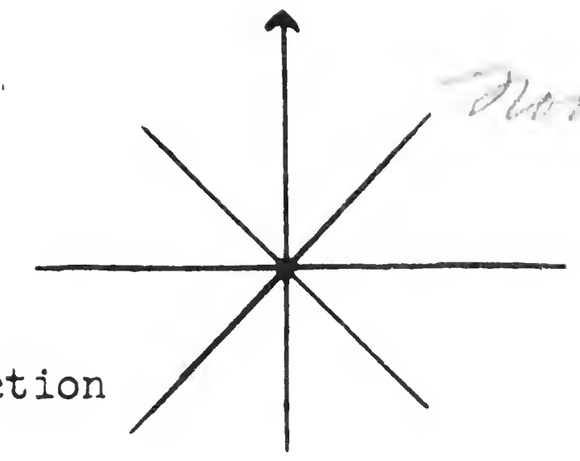
SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 23 SEPT 67
Pg.#

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
0720-0800	SPOTTED PORPOISES	15-20			off to NE - under bow - in front of bow
	WHITE-BELLIED PORPOISE	1			w/ REMORA TYPE FISH - in front of bow
	PORPOISE	1			UNID.
0740	DUNLIN? SANDPIPER	1	→N		
	BROWN BOOBY	1	→N,NE		
	BLUE FACED BOOBY	5			1 IMMATURE
	Manx NEWELL'S SHEARWATER	10	→E		
	B/a cp LEAST TERN	2	→E		
1100-1130	FRIGATE'S	10			circling; very green water - many blue-green & freshwater plants, much dead plankton - in/on "rafts" of debris
	Dolphinfish	2			
	Wilson's	19			
	Northern Phalaropes	15-20			in midst of & around "rafts" of debris - on surface
	BLUE FACED BOOBIES	20-25 ad 1			on logs that had floated by - 1-5/log
1430	Sooty Shearwaters	2			Can see land -
1525-1600	BLUE-FACED BOOBY	10			common - few flying
	BROWN BOOBYS	4			2 immature around on logs
	" "				
	Northern PHALAROPES	15			2 small groups flying
	Porpoises	2			small black - jumping in front of bow
	Spotted "	2			
	Terns: Least?	8			3 species least?; 1 - charcoal wings dirty gray belly w/eye stipple; 5 - too far to IDEN. - Grey tipped dark wings
		101-111			

off shore, most of day 10-20 miles

3 HRS



Ship Direction

Noon 13°15'N - 87°48'W

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

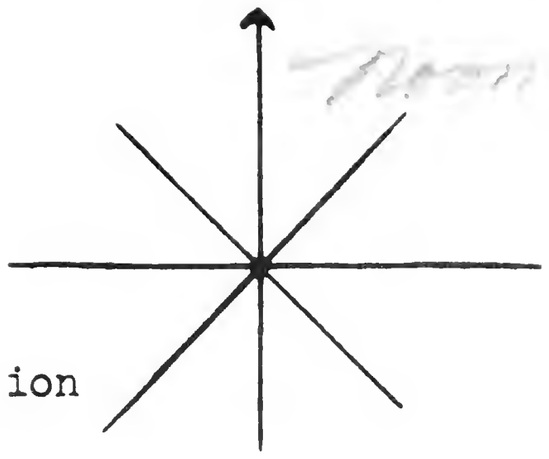
OBSERVERS:

Date 24 SEPT 67
Pg.#

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
0600					5 ft La Union
0730	Brown Pelicans	3			
	Frigate Birds	15			
	in Bay near La Union — no gulls seen - only Pelicans & frigatebirds most of which are on shore with Willets & Sandpiper.				

18

Noon — 12°09'N — 87°17'W



Ship
Direction

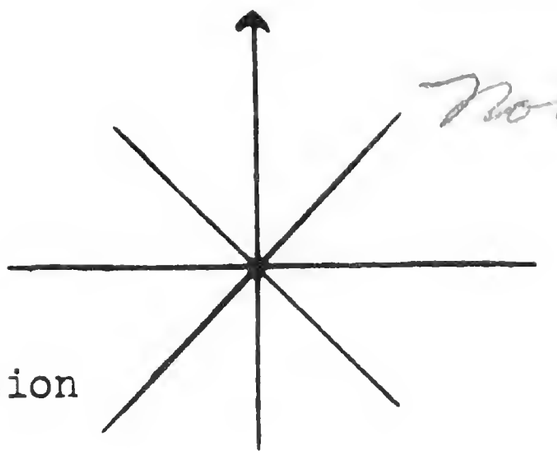
SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 27 SEPT 67
Pg.# 227

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0700	Brown Pelicans	200			Departed La Union for PANAMA
0815					ON water; 20 ± 10 flying & landing
	Frigates	15	common		
2400	Tern	1			
1050					
1100	(Green) Turtles	8			1 every 200-300 yards
	Brown Boobies	10			
	BLUE-FACED BOOBY	1			

1 HR OBS



Ship Direction

Noon 7°36'N - 82°52'W

OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 28 SEPT 67
Pg.#

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
0600	~~NEWELLS~~ Many SHEARWATERS	2			
0630	DUCKS	8	→ SE		to far off to IDEN.
0730-0745	~~NEWELLS~~ Many SHEARWATERS	25-30			feeding flock -
0800	BROWD ~~FREGBY~~	2			
				37-42	1 HR OBS

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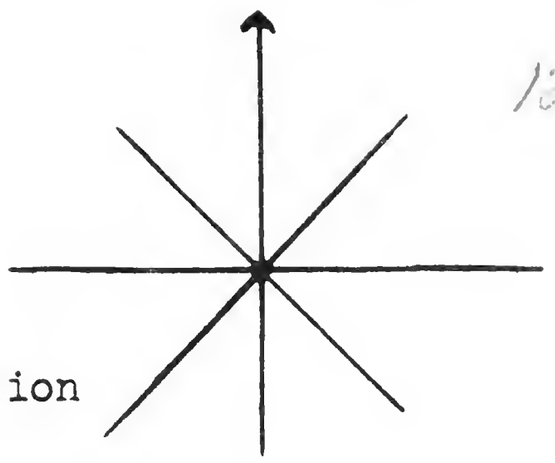
1300 - 05°55'N 78°05'W

OBSERVERS:



Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 1 AUG 67
Pg.#

+5 ℰ TIMES IN LOCAL

TIME	SPECIES	#	SPECIMEN or DIR. BAND NO.	REMARKS
1500-1600	SULA LEUCOGASTER	5-10 (about 25-30 total)		2-3 groups flying about ship - diving - feeding on small fish just under surface
O. Tethys Rel 3	OCEANODROMA OCEANICUS	10		~~circling~~ about surface near ship
	O. leucorhoa	5		" " " "
	Fregata minor Frigate bird	15		circling overhead

OBSERVATION TIME - 1 HOUR

(4L 55 60)

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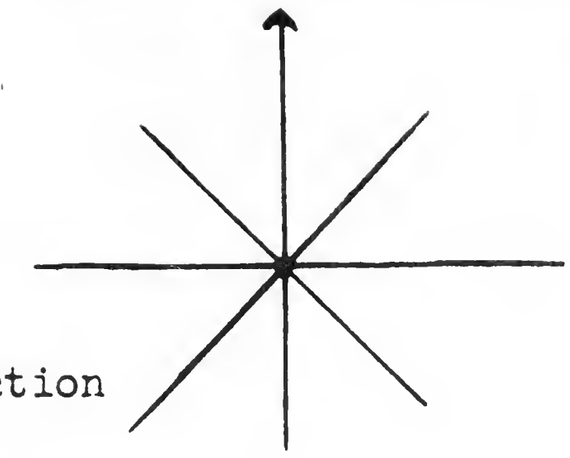
Rev. 5-66



Ship
Direction

OBSERVERS:

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 2 AUG 67
Pg.#

TIME	SPECIES	#	SPECIMEN or DIR.	BAND NO.	REMARKS
		NO OBS			

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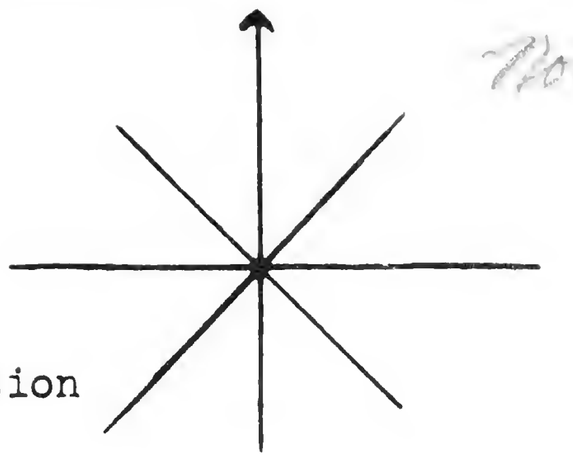

Ship Direction

1800 - 05°41'N 80°31'W

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 3 AUG 67
Pg.#

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
1500	(O. Louisiana) O. Tethys Rel 3	20			feeding in wake
		20			OBS TIME ½ HR

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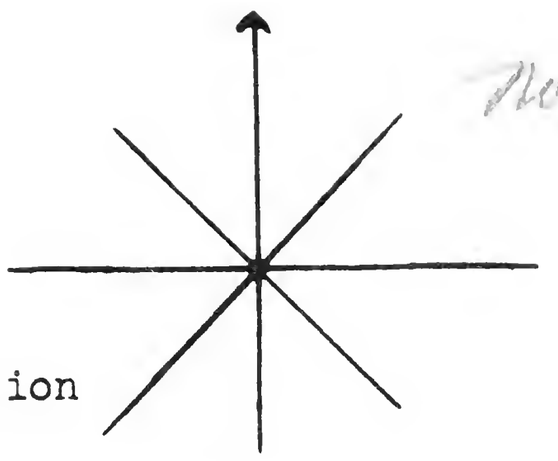

Ship Direction

Noon - 03°09'N - 79°41W

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 4 AUG 67
Pg.#

TIME	SPECIES	#	SPECIMEN or DIR.	BAND NO.	REMARKS
1000-1500	(O. leucorhoa) O. tethys-Rel 3	10-15			about surface & wake - mean stern on & off station
	Sula dactylatra	1	190°T		
	UNIDENTIFIED TERN	1	225°T		
	(O. leucorhoa O. oceanicus) O. Tethys Rel 3	20-30	—	—	in wake
					5 HR OBS
		32-47			

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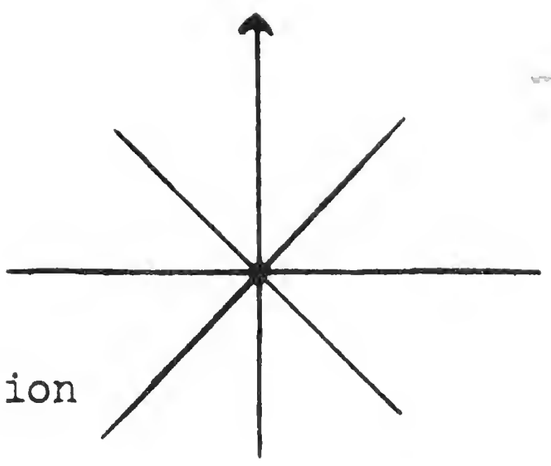
Rev. 5-66



Ship Direction

noon - 01°07N - 81°37W

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

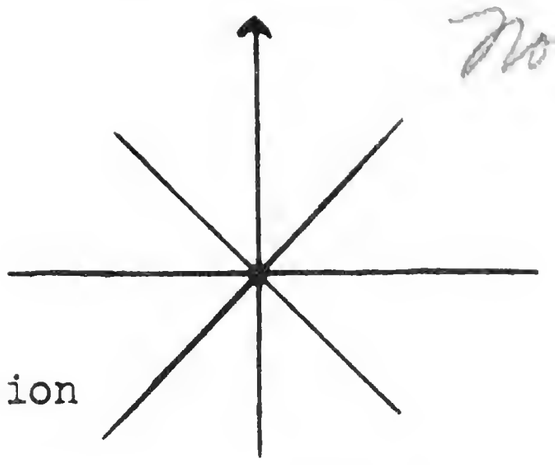
OBSERVERS:

Date 5 AUG 67
Pg.#

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
1500	(Oceanodroma leucorhoa? O. Tethys Rel 3				20-25 kts 600yd off - feeding on surface
2000	O. (leucorhoa) O. tristrami	2	O. Tethys Rel 3		caught on deck, (identified as Galapagos S.P.)
	O. ~~townsendi~~	1)	Oceanodroma		
2015	Storm Petrel) Oceanodroma	1-2	-		white rumped - flew into & out of arc of light
					OBS TIME: ½ HR
					24 - 30

Noon 10°14'S - 82°01'W

OBSERVERS:



Ship Direction

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

Date 6 AUG 67
Pg.#

TIME	SPECIES	#	SPECIMEN or DIR.	BAND NO.	REMARKS
1145	O. leucorhoa	15			Back & forth along surface
	(Sooty Storm Petrel)	2			" " " "
	Bulwer's Petrel	2			
	Tropicbird	1			
		18			DBS TIME 1 HR

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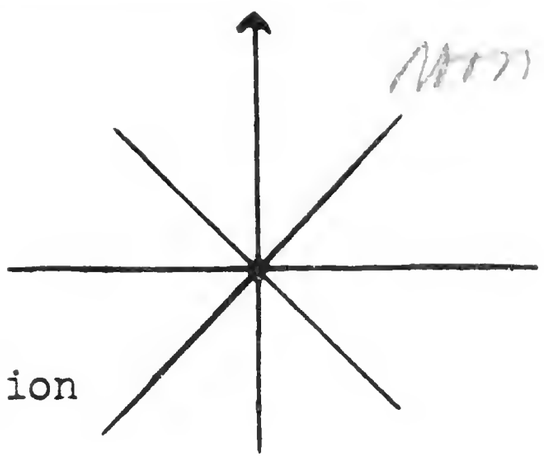


Ship Direction

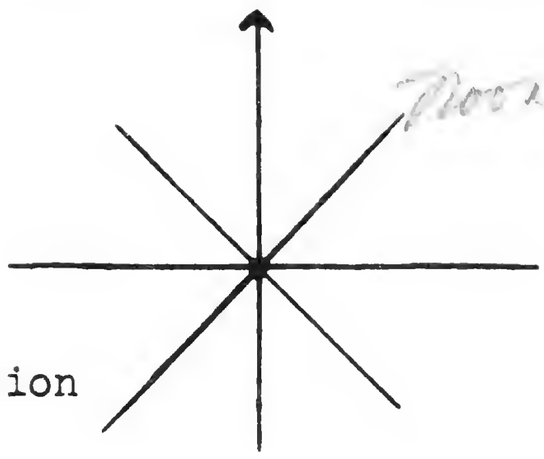
NNW 2°28S — 80°04'W

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 7 AUG 67
Pg.#

TIME	SPECIES	#	DIR.	BAND NO.	REMARKS
0700-1000	O. tethys (Leach's SP)	25			
	(Franklin's Gull	100)			various color phases } off mouth of & up Guayas River to Puerto Nuevo - Guayaquil, Ecuador
	Brown Pelicans	20			
	Brown Boobies	15			
	Cape Pigeon	20			
Mag.	Frigate Birds	75			
	White egrets along banks of river	15			
	√Larus cirrocephalus	75			
	Larus modestus	25			
		=70			



Now 02°45S – 80°21'W

SMITHSONIAN INSTITUTION
DIVISION OF BIRDS
AT SEA DAILY LOG - E

OBSERVERS:

Date 9 AUG 67
Pg.#

TIME	SPECIES	#	DIR.	SPECIMEN or BAND NO.	REMARKS
	Some birds seen going down river, as usp.				
1400-1420					porpoises (20-30) about 10 mi SW of River mouth (Guayas)

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Rev. 5-66

EASTROPAC

CGC ROCKAWAY (WAGO-377)

AUGUST - SEPTEMBER 1967

San Diego

Manzanillo

47527

LA UNION

47534

47268

PUNTARENAS

47258

PANAMA

COCOS ISLAND

47001

47640

GUAYAQUIL

S. A.

47103

LIMA

47124

47402

47382

47151

30°

20°

10°

0°

10°

20°

120°

110°

100°

90°

80°

—— CRUISE TRACKLINE (SURVE

- - - TRANSIT TRACKLINE

EASTROPAC - CGC ROCKAWAY
AUGUST - SEPTEMBER 1967
LIST of BIRDS CAUGHT ABOARD VESSEL

STA.	DATE	TIME (LOCAL)	LAT	LONG	NO.	SPECIES
✓ 47053	6 AUG 1967	2045	00-18N	081-57W	2	OCEANODROMA TRISTRAMI
					1	O. ETHYS
between 47072-47073	10 AUG 1967	0405	03-28S & 03-47S	082-01W & 082-02W	3.	O. HORNBYI
					1	O. ETHYS
					1	OCEANITES OCEANICUS
47101	12 AUG 1967	0400	09-29S	082-05W	1	O. HORNBYI
47109	13 AUG 1967	0400	09-35S	080-15W	1	PTERODROMO COOKI COOKI
5-6 MILES SW. of COCOS IS.		0400	—	—	1	SULA SULA
CHATHAM BAY, COCOS ISLAND			—	—	3	ANOUS STOLIDUS
					1	GYIS ALBA
47310	4 (5) SEPT 1967	2300			2	FREGATA sp.
		→	02-02N	088-03W	1	SULA SULA

Date: 6 October 1967

OCEANOGRAPHIC CRUISE OPERATIONAL REPORT

From: Commanding Officer, USCGC POAMANO (WAGO 377)
To: Commander, Northern Area

PART I - CRUISE PERFORMANCE

1. Survey Area - - - - - - - - - - - - - Northern Trinidad Coast Sea Space

2. Concise statement of mission: Participate in POSTCRUISE oceanographic survey to collect physical, chemical, and biological oceanographic data in the entire of the Northern Trinidad with numerous stations placed on the continental return and ocean within 100 miles of a coast line in the region.

3. Departed homeport - - - - - - - - - - - - - - - - - - - 211952 JUL 67

4. Arrived in survey area - - - - - - - - - - - - - - - - 011952 SEP 67

5. Departed survey area - - - - - - - - - - - - - - - - - 210930 SEP 67

6. Arrived homeport - - - - - - - - - - - - - - - - - - - 051530 NOV 67

7. Length of cruise(days) homeport to homeport)- - - - - 76 days

8. Distance to and from survey area - - - - - - - - - - - 5,130 miles

9. Distance cruised in survey area - - - - - - - - - - - 3,750 miles

10. Total distance run - - - - - - - - - - - - - - - - - - 14,137 miles

11. Augmentation personnel boarded

NAME	TYPE	ORGANIZATION
LTJG D. R. JAMESON, USCG	Oceanographer	USNS Oceanographic Unit
ADJ D. D. LOCKLEAR, USCG	Oceanographic Technician	" " "
SK S. D. ROBINSON,USCG	"	" " "
M. L. BLAKE	Oceanographer	Inter-American Tropical Tuna Commission
L. BIOLOGG	Student	Scripp's Institution of Oceanography
L. F. JOHNSON	Graduate Oceanography Student	" " "
J. J. McCLURE	" "	" " "
T. T. TESTS	Meteorologist	USAF - Weather Service
C. E. UNIT	"	" " "

PART II - SAR, COMMUNICATIONS AND MISCELLANEOUS

1. Number of distress, urgent and safety messages intercepted:

TYPE	MARITIME	AERONAUTICAL
SOS	1*	0
XXX	17	0
YYY	38	0

*Relay from NSS. Auto alarm employed.

2. Instances of assistance (including communications, aids to navigation, radar fixes, medico, etc. Explain in Part V) ---------- 0

3. Number of persons rescued ---------- 0

4. Number of rescues aboard ---------- 6

5. Frequency Plans used ---------- A1,A2,Berthe

6. Percentage of traffic transmitted via SAT ---------- 93.45

7. Maximum communication distance experienced ---------- 2,700**

8. Most reliable frequencies:

DISTANCES	DAY	NIGHT
2000 or less	1275/16683.2	6367/8682
2000-2500	16683.2/22545	8682
2500-3000	22545/25020	12754
3000-3500	--	--
over 3500 mi.	--	--

**WHILE CRUISING NEARS. 3,600 MILE CRUISE MADE.

PART III - METEOROLOGY

1. Number of MERSEP observations relayed - - - - - - - - - - - - - - 1

2. Number of:

TYPE OBSERVATION	TRANS. TO SHORE STATION	NOT TRANS. TO SHORE STATION
Routine Surface Obs. at Synoptic hours	459	0
Special Surface Obs.	19	0
Upper Wind Electronic Obs. (RAWIN)	38	0
Radiosonde Obs.	79	0

PART IV - OCEANOGRAPHIC PROGRAM

A. POSITIONS OF VARIOUS STATIONS OCCUPIED

1. The general area surveyed, described as Track VII of the Eastern Tropical Pacific Oceanographic Project, is shown on Enclosure 2 to this report. Specific positions of each station, together with times, type surveys made and the position accuracy estimated are attached as Enclosure 1.

B. BATHYTHERMOGRAPH PROGRAM

1. BT observations made:	ENROUTE	OPERT AREA	TOTAL
200' mechanical	0	0	0
450' mechanical	0	0	0
900' mechanical	0	10	10
Expendable BT (XBT)	19	256	275

C. HYDROCAST (NANSEN CAST) PROGRAM

1. Casts made: 500 meters 61
   1000 meters 77
2. Deep (bottom) casts made 21

D. STD (SALINITY-TEMPERATURE-DEPTH) PROGRAM

1. 300 meter observations 49
2. 500 meter observations 133
3. 1000 meter observations 79
4. Total STD observations made 261

E. PLANKTON NET TOWS

1. Surface tows 156
2. Oblique double net tows 152
3. Micronekton tows 79
4. Total plankton net tows 387

F. SOUNDING PROGRAM

1. Number of miles of sounding records to and from area: 5,270
2. Number of miles of soundings in survey area 8,731
3. Total number of miles of soundings 14,001

PART V - SUMMARY OF OPERATIONS

1. Wells to be ports during the drilling

Port	Arrival Time	Departure Time
Corpus Christi, Texas	2/15/65 1200 GT	2/17/65 1200 GT
Tampa, Florida, Coast Pilot	2/20/65 1200 GT	2/21/65 1200 GT
Savannah, Georgia	2/25/65 1200 GT	2/27/65 1200 GT
Dallas, Texas	3/3/65 1200 GT	3/5/65 1200 GT
Jacksonville, Coast Pilot	3/8/65 1200 GT	3/10/65 1200 GT
Corpus Christi, Coast Pilot	3/13/65 1200 GT	3/15/65 1200 GT
Dallas, TX, Collector	3/18/65 1200 GT	3/20/65 1200 GT
Tampa, Florida, Coast Pilot	3/23/65 1200 GT	3/25/65 1200 GT

2. Additional special projects carried out during the cruise.

Type	Performed For
a. Oceanography (recording salinity, temperature, suspended organics, and pollutants)	Texas A&M University
b. XBT Dips (At 50 mile intervals or special conditions of current break)	Bureau of Commercial Fisheries La Jolla, San Diego, Calif.
c. ADP and XBT Dips (Alternate stations with ADP at the center and XBT at the corners)	Bureau of Commercial Fisheries La Jolla, San Diego, Calif.
d. Bongo (Neuston) Tows (Surface water tows)	US Environmental Data Service, Washington, D.C.
e. Chromatography, extraction and separation of marine life, chemical and biological	Smithsonian Institute
f. Echosounding profiles (for marine fish stock studies)	Bureau of Commercial Fisheries La Jolla, San Diego, Calif.
g. Medical studies, samples of seafood consumed	Consultant, USPHS

Part V - Summary of Observations (cont.)

b.	Collection of plant and animal specimens - Insect Traps, Cards, Jars	Collections will be maintained to perform systematic investigations and surveys
c.	Isolation, culture and survey of plant, animal cells or tissue, fungi	Survey of Commercial Procedure, to Define Specimens Role

d. Equipment Losses and/or Damages:

	Equipment Description	Cause of Loss or Damage
a.	Gas Trough Bottle complete with Gas generator *	First Loss between ship & plant and bottle assembly failed. A further modification (as shown on Table-ware 3) was made to all Larson bottles to correct this defect. The modification has successful.
b.	Gas Alcohol	Lost overboard during overboard
c.	Gas Larson bottle	Short neck Larson bottles bottle to separate from glass
d.	Gas complete culture set	Left overboard
e.	Gas complete culture media set (powder)	Powder Gas packet ones to excess humid tropic because to heavy moisture
f.	Approximately 150 feet 3/16" O.D. polyethylene plant culture tubing	Cut short end to correct length at various and lost to many ends
g.	Approximately 20 feet 3/4" polyethylene clear plastic tube, O.D. size	Cut off end to correct length at various and lost to many ends

*Notes: Record of survey mentioned on item a.

e. Additional accounts, responsibility and recommendations:

f. Personal report information:

(1) Responsibility, Validity. The Chief-in Agreed to Surrender at any time for a 30 day continuation notice. The Safety Directions for the past were satisfactory except with regard to the interruption to discharge the Gas that a plant test is on duty 3/4 value work at the Laboratory. Although minimum recommendations were made through Office, the Director was to well aware for being the Gas-recommendations plant. Then should, be stated that they advised the Headquarters from 0500 to 1200 during the course of Gathering Turnish Media. At other times they were called on 2/30 hrs. The plants provided were competent and Agents Cognizant

The vessel berthed at a modern pier, the face of which was parallel to the axis of the Rio Magdalena River which runs at about a four knot current. Official calls were made on the Captain of the Port and on CAPT Ortiz, the Commanding Officer of the Colombian Naval Base at Barranquilla. Several ships officers and the senior civilian passengers were guests at a cocktail party given by the U.S. Consul, Mr. Robert J. Corle. A car and driver were furnished to the ship by the Colombian Navy. No stores were taken aboard.

(2) Buenaventura, Canal Zone. Outbound, the NORTHWIND stopped at the Pedro Naval Base overnight. 51,000 gallons of navigational fuel, some stationery and exchange supplies and comfort items were taken aboard. Also three civilian scientists from Scripps Oceanographic Institute joined the ship here. An official call was made on CAPT Purcell, USN, the Commanding Officer of the Base and a call was considered to have been made on Governor Fifield, Balboa Area, USN. Logistic support, in the immediate charge of LT J. Cole, USN, was pleasant and enthusiastic and a letter of appreciation was directed to the Commanding Officer of the base.

(3) Guayaquil, Ecuador. On 7 August the NORTHWIND arrived at Guayaquil for a two day recreational visit. It is to be noted that the Sailing Directions did not give the correct location for the pilot station. However, this information was furnished by ARSOUTH prior to arrival. Also, 7.10, Chart No. 5919 does not show the extensive dredging which is presently provided in the Guayas River. The ship was berthed at a modern pier complex known as Puerto Nuevo, about 12 miles from Guayaquil. Availability of a berth was a fortuitous happenstance since the NORTHWIND could not be accomodated if commercial ships were waiting. In order to the Ecuadorian Navy afforded the ship, an Indoor officer, during the entire stay. He was a graduate of the U.S. Naval Academy and was right at home on a North American ship. Also, the Navy made available a car and driver. Official calls were made on RADM F. Espinosa G., Commander of the First Naval Zone; Sr. M. Morales A., Governor of the Province; Mr. A Bucaram, Mayor of Guayaquil and Mr. R. Schwidersky, the U.S. Consul General. The port was about 47.9 miles up the Guayas River and pilotage was mandatory. The pilots provided were competent and spoke English. No stores were taken aboard.

(4) Callao, Peru. Arriving on 14 August, NORTHWIND anchored in the roadstead at Callao for two days. Mooring were not used, although a Peruvian Naval Officer boarded with an anchorage assignment. NORTHWIND's boats were used as liberty launches. Liberty was made to Lima and to Miraflores, 5 miles away. Official calls were made on RADM L. Ferreyros N., the Commandant General of the Fleet on board his flagship and on CAPT A. Bermudez P., the Port Captain of Callao. A Indian officer and a car and driver were provided by the Peruvian Navy during the entire visit. Also was an interesting foreign port but it was not a vacation visit due to high prices. Officers were not taken.

(5) Pascagoula, Gulf Coast. A two day fueling stop and recreational visit was made at Pascagoula. The ship was berthed alongside a pier, assisted by tugs in the pier, an indoor to passers and liaison officers to a nearby town. The published soundings were reported because of the exposed location of the pier. The ship continuously pulled and surged in a heavy ground swell. It was necessary to provide at the pier to receive

the fuel which was pumped from several small tank trucks. No damage was inflicted except for scraped mooring lines. However, there was so much work and worry incident to being at the pier that conference is not recommended as a fueling stop. The port is interesting and a visit, with the ship at anchor, is worthwhile. Other than that, no stores were taken. Pilotage is compulsory for going alongside. The pilot was competent and spoke English. The docking directions and charts were found to be satisfactory except that the colored coastal navigation light, Isla Blanca (No. 25250 in Light List H.O. 1118) marking the entrance to the Golfo de Nicoya could not be seen at night 12 miles off although it is indicated as a 25 mile light. Upon departure, the Cape was rounded 5.0 miles off and it was observed the light structure, an Eiffel tower-type steel lattice, had collapsed and was lying horizontally on the crest of the Cape.

(6) Caldera Island. Caldera Island was not a scheduled visit, however, a stop was made there at the request of Mr. Klaus the Swiss civilian oceanographer so that he could survey the site for a tidal gauge proposed to be installed by the Bureau of Commercial Fisheries. After permission was received from the Government, the island was approached on the premise that a landing would be made only if the most conditions permitted. Satisfactory conditions were found at Caldera Bay and the survey group was landed. Also, the opportunity was taken to hold a whale party ashore. Over a period of eight hours all hands and others in ranging in unbuilded, trained island pick in pirate lores. The [illegible]'s bows was directed into a boulder on the beach consequently our visit in the area became as other ships had done, with dates going back to the 1700's.

(7) La Union, El Salvador. After completion of the oceanographic station, the SACRAMENTO stopped at La Union for a three day visit while enroute home. No pilots were employed. The sailing directions for the port and the approaches were found to be correct and current. However, an unlisted navigational aid, the light structure in the south of the Golfo de Fonseca were found to be inaccurately located on H.O. Chart No. 972. The ship's topography in the area provided ample means to ascertain and orient ourself the vessel's position after the latest determinations were completed. The only way barred at the outset plus for the boats to take on 13,000 gallons of fuel after which the stevedores in La Union Bay for the remainder of the visit. Two of the civilian scientists were disembarked at this port. An official call was made on Admiral Herrera, the Captain of the Port, and he made use of his patrol boats (a 65 type 40 footer) available to support the OCEANOGRAPHER's survey tasks. As a good will gesture towards the community, 28 boxes of soft drinks were contributed to the local orphanage. While this visit, no liberty was taken of this port.

(8) Puerto Armuelles, Panama, Canal Zone. Another brief call was the final port before return to Pearl Harbor. The ship berthed two alongside to take on 119,000 gallons of service diesel fuel and made necessary and routine stores. Three persons, including Captain Bruce Lawrence, civilian scientists, and personnel from the Coast Guard Oceanographic Unit were disembarked. The Canal transit was made on night

b. Electronics. All electronics equipment functioned satisfactorily. Time spent on repair of outages was not in excess of the average maintenance/operation ratio except in the case of the following equipment:

(1) AN/SPN-12C - Omega Navigation System. An inordinate amount of time, both day and night, was spent in synchronizing the Omega stations. Each synchronizing operation would last about one hour and sometimes it would have to be done three times a day. Probably one reason for this difficulty is the fact that no personnel on board have been trained in the maintenance or adjustment of this sophisticated and unique equipment.

(2) AN/SRT-23 - Radio Transmitter. A routine requirement to communicate on a daily schedule with a commercial station on Voli as a Coast Guard station, together with the ship's operating procedure of using dial transmitters sometimes as often as fifty times in a single day. This placed a burden on the mechanical components involved in frequency shifting which, because of the age of the equipment and the unavailability of parts, created a problem of excessive maintenance and a continual threat of major failure with resultant loss of communications. This condition was controlled during this cruise but it has not been resolved. Long oceanographic trips will necessary an increase in the OPTAR spared for the AN/SRT-23 Transmitter.

(3) Teletype equipment functioned well for the first six to eight weeks of the cruise. After that time numerous adjustments became necessary due to normal wear on the equipment. Outages became frequent and excessive man hours had to be utilized probably because no personnel assigned here been trained for this equipment.

(4) Because of its electronic character, ET's were called upon to repair inoperative oceanographic equipment. Although several effective repairs were accomplished, the time expended was disproportionate due to basic unfamiliarity with the equipment and lack of adequate instruction manuals.

c. Communications.

(1) Communications with COMNAVOCEANCOM New York (NAVY) and COMNAVOCEANCOM Portsmouth (NPN) were excellent during weekend and inbound transits of Third and Fifth District waters.

(2) For the major portion of the voyage, COMNAVOCEANCOM San Diego (NAM) was used as the primary relay point for all traffic. Communications were classed as good, with approximately 95 per cent of traffic originated by radioteletype (RATT) and the remainder by code (CW). Whenever contact with COMNAVOCEANCOM San Diego was lost, COMNAVOCEANCOM Hawaii (NAH) was used as a back-up. Less than 5 per cent of the volume was passed by this route.

(3) Heavy skeldon interference (Brazil, Denmark, Japan, Spain, U.S. and Russia) was noted on the 17 and 22 circuits during hours of darkness. Good to excellent communications existed during all daylight hours. The higher frequencies of 22565 and 23180 kilocycles were generally clear of interference and afforded good to excellent signal strengths.

(4) The beam antenna installed at COMNAVACT New Orleans to service NOTAZAM went into operation about mid-September. Thereafter, an average signal of strength "three" increased to "five" when this antenna was employed.

(5) Continuous watches were maintained in all ports and transmissions were generally good except in Guayaquil, Ecuador, and in Callao, Peru. Difficulties in these ports were attributed to surrounding mountains.

(6) In addition to the Coast Guard circuit, NOTAZAM was required to maintain direct communications with NAD, the Bureau of Commercial Fisheries station at La Jolla, California. 17025 kilocycles proved to be the most reliable frequency of those available to that station. Daily status reports and general RADIOGRAM messages were passed to this station on five daily scheduled except for a period from 16-24 August when one AN/FRC-23 transmitter failed.

(7) Based on the above experience, the following recommendations are made:

(a) That the oceanographic frequencies formerly listed as alternate #14 (6246, 8375, 12477, 16528 and 22150 kilocycles, SAIT) be returned for usage during the January-April RADIOPAC. This would provide sufficient alternate frequencies to be employed when periods of heavy interference are encountered.

(b) That permission be obtained from Commandant to employ CW radiation on aircraft A2 frequencies whenever the A3J mode becomes untenable.

c. Engineering. The machinery plant performed satisfactorily throughout the cruise. Fuel economies were effected by the regular operation when running between oceanographic stations. Cruise planning included a scheduled fueling stop at Puntarenas at which time 30,000 gallons were to be taken. However, because of the price of 13 cents a gallon, this quantity was reduced to 21,000 gallons. Performance figures for the first half of the cruise indicated that this would be sufficient. However, a moderate but consistent operational difference in the second half of the voyage necessitated a second, and originally unscheduled, fueling stop. This was made at Callao where an additional 15,000 gallons were taken at approximately the same cost per gallon. In both ports the fuel was of good quality having little sediment or water content. In Puntarenas the fuel was pumped from tank trucks and required about two hours to take on 21,000 gallons. In Callao the fuel was received from two 5000 gallon railroad tank cars and the gravity fed to

the vessel in a most nice expeditious manner. The bailers and evaporator performed satisfactorily. Water hours by salt water showers did not have to be imposed and fresh water was taken aboard only at the Panama Naval Base. The electrical plant performed satisfactorily. There was a major casualty to the voltage regulator on the No. 2 generator which could not be repaired by the ship's force. A spare was put on the allowance list. Procurement of a replacement from the U.S. was attempted but was unsuccessful. The difficulty was overcome for the duration of the cruise by jury rigging the regulator transformer on the No. 1 generator so that it could be switched to serve whichever generator was on the line. The three engine flushes performed satisfactorily. There were failures but these were repaired without loss to the mission. The failure involving the new circumferential ring which was already scheduled to replace the existing one at the time of overhaul. A bolt nerve which secures the auxiliary drive sprocket to the keyway of the replenishment pump shaft had not been installed. This prevented the sprocket to slide on the shaft causing the misalignment and ultimate failure of the chain drive which was driven by this sprocket. A replacement chain was not included in the repair parts. Only by a temporary repair was effected by disassembling the chain and reinstalling its component parts to fabricate a new chain of longer width than the original. This repair served satisfactorily for the remainder of the cruise.

e. Operations.

(1) Navigation. While in the Mediterranean Sea, three methods of navigation were available, namely dead reckoning, the Decca system, and celestial. Usage was put mainly because it consistently a position accuracy ranging from eighteen to 25 miles off land-confirmation against accurate fixes obtained by other means. This was certainly unsatisfactory in the face of specific tactical requirements promulgated to be followed in certain areas. Celestial navigation and its accuracy varied much but due to a combined lack of good ocean environment to the operating area, position fixing had to be by opportunity rather than by a schedule. Consequently, accurate positions many times had to be made on the basis of dead reckoning with the last information on the actual position of the station established which sometimes became quite old. Often the position of record for any station was the one based on the most information available at that it was established, a fix prepared four days before it was utilized. One form was prepared for each station. It was initiated by the C.O.D. as the time the station was taken and it was not completed and released by the Oceanographic Department until the navigator had made the final determination of position and precise spotting.

(2) Mooring. On 12 September 1957 Corpus Christi Bay, Texas became uncleanly fit and a power collection of a Soviet fishing vessel was observed from the naval Training Station Island. Ship proceeded upstream and recommended mooring. This was not possible because of the depth of the channel at the mooring. Four alternatives were considered -- (1) the position of Texas City (2) arrival at the next port (which might involve proceed to the general local for more ship (3) use the telephone (which does the natural facilities were questionable) (4) return to South Carolina. A decision was made to transfer the patient to a disembarked ship. All four alternatives were considered.

Public Health defined a symptom which would make the case an emergency — the symptom appeared. USPHS Senator advised that competent medical personnel were stationed in the Galapagos. ARVEN provided data on two ships suitable to our purposes within thirteen minutes after a request for a 72-hr sample of coast-bound ships had been transmitted. The latter alternative was selected because it offered the least diversion from the mission. Attempts to raise the ships on radio were unsuccessful for about twenty hours and then contact was made with the British freighter SS SOMERSET, Captain Wanton commanding. Captain Wanton was extremely cooperative and at 1700 GMT on 13 September he diverted his ship to rendezvous with ROCKMAT at 1200 GMT on 14 September. The rendezvous was made at the appointed time and position and ARVE BRAUT was transferred by small boat for transportation to Baltra. The SOMERSET then turned south to resume her oceanographic survey at the location where it had previously been halted.

c. Meteorology.

(1) Forecasting.

(a) In accordance with CINCLANTFLT sailing orders and the Naval War Plan Meteorological Observations, a survey of the Eastern Tropical Pacific Ocean was conducted by the ROCKMAT from 7 August to 23 September 1967, concurrently with similar surveys being made by the WYNGAPORE, operated by the Bureau of Commercial Fisheries, and the SPROUL (ALBATROSS), operated by the Scripps Institution of Oceanography. ROCKMAT's basic purpose involved operations at three types of oceanographic stations, termed A, B, and C stations, along translines off the coast of South and Central America extending as far as 130 South Latitude and 95° West Longitude. (For a detailed summary of observations at each station see Enclosure (1), Observations at A stations, recorded twice daily at local sun multiples, included 1000 meter STD and Nansen-cast, hydrocasts (for productivity and plankton determinations), drifts, buoys, and secchi-disk (to determine light penetration). B stations, at midnight stations for collection of physical, chemical, and biological data. Subsequent analyses included quantitative chemical determinations of oxygen, salinity, silicate, alkalies, phosphate,

phosphates, and ammonia (frozen for later analysis ashore) and biological determinations of plant pigments, and productivity. 8 stations, taken daily between 4 stations, involved 300 meter BT and hydrocasts, and oblique and surface plankton tows; shorter analyses were carried out as above. At 6 stations, sampled alway between the 4 and 8 stations, only expendable bathythermograph observations were made. 4 and 8 stations were generally separated by 40 miles so that the effective sampling interval was about 21 miles.

(b) While primary, continuous observations for the majority of the cruise included depth, near-surface temperature and salinity, near-surface chlorophyll, incoming solar radiation, wet and dry bulb temperature differences, three-hourly surface weather observations, and twice-daily upper air observations and, additionally, a survey of bird life was made including sheltered count, identification, photography and specimen collection.

(c) Between 5° North and 5° South and then within 100 miles of land 300 meter XTB casts were made in lieu of the usual BT observations at 8 stations, and among between all stations XBT drops were made. This reduced the sampling interval in these areas to 10 miles. To the basic transitman hydrocasts to as close to the bottom as possible were made every second day. Along Ground-Lags (i.e., passages from one sampled transline to the next) 300 meter XTB casts were made every 20 miles.

(d) A stop was made at Ponta Delgada to examine possible sites for the installation of a tidal gauge for the Bureau of Commercial Fisheries. While ashore on the island, biological specimens were collected.

(2) Performance of Oceanographic Equipment and Instrumentation.

(a) The XBT System.

1. The XTB functioned efficiently throughout the cruise except for two failures which resulted in some lost data at three stations. The first casualty resulted from a loosened terminal within the temperature sensing element, and the second from a slow leak in the depth sensing Lucite internal connection to what we referred that end of the printed circuit had opened and had to be rebuilt.

2. The 1/4" polyurethane armed electronic conductor cable served well during the cruise. It was extremely useful at times to reserve portions of the outboard and inboard trailing edges of accessibility. The resolution of the cable appears to be satisfactory in that there are no kinks, severe abrasions, etc. However, care must be taken of its age and the use to which it has been subjected. It is understood that Sedgwick Institution, on their oceanographic vessels, replaces this cable every six months to prevent the loss of the expensive XBT unit.

3. The cable problem with the XBT system should be solved (a) by the location of the winching system (the cable is located on the starboard, port, of frame 77, and the bathythermograph platform is on the port quarter), and (b) by the use of a longer cable. The winch over which the cable runs is approximately 10 feet above the water and this, together with the height above the water and this, together with the height above of the hull and

the additional input on the CP deck, results in inadequate clearance when handling the 170 lb. underwater fish. It only requires a 6" roll for the fish to strike the hull when it is being raised or lowered. Although fully well protected by a moulded steel fairwater, shelled with solid rubber bumpers, the sensitive electronic components undoubtedly suffer from the accelerated impact forces while lifting the ship. The failures referred to above may have been attributable to this cause.

(3) ADP-62 Computer.

1. The ADP-62 computer and its associated input/output unit satisfactorily completed all the data processing for which it was scheduled. This included conversion of recorded temperature, density, sound velocity, and cyanide height visually calculations from ADP obtained data; calculation of threshold concentration (oxygen, nitrates, nitrites, phosphates and silicates), predicted presence of fluorescing readings in chlorophyll and photosynthesis determinations; calculation of distances between stations from positional information; and conversion of coordinates, as examined by laboratory calibrations, to validity. However, the operation of this equipment was erratic and required excessive operator time. During the first three weeks of operations difficulty was encountered in getting the computer to operate at all. Program tapes fed in through the tape speed reader frequently at times, and at other times not at all. When program tapes did feed in, the computer worked well sometimes for an hour or two at most, then stopped and would not restart, or even read in a program tape. Reported attempts to get it going failed, with even temperature was suspected as were the moisture regulator and the cooling fans. After trying various combinations of room temperature, voltage regulator on or off, and fans on or off, the problem somehow eliminated itself for no known reason, and for the remainder of the cruise operated with intermittent computer failures.

(4) Hydrographic Cable. Reportedly twice to this cruise the 3/16" stainless steel (#19) hydrographic cable was replaced with a newly developed, three strand, galvanized wire rope. It is identified as United States Steel Three Strand 3/16" stainless steel 7x19 wire rope. It is claimed advantages to greater strength and increased resistance to corrosion and wear. These qualities could not be evaluated except that it is noted that there were no failures and no fish hooks or kinks were developed. Service experience with this cable is considered to be satisfactory, however, the following observations are noted.

a. Due to the nature these wires cannot be spliced or terminated, if they are cut or split the entire cable must be discarded.

b. It should be noted the density and weight of the 3/16" stainless steel, it was learned, handles and operates to advantage.

c. The hydrographic engineer must be careful to "play out" on the wire freely. It requires less tension to pull the cable through the water than to be released.

4. The wire vibrated when under load in the water. This phenomenon was not experienced with the former wire. This is not necessarily an adverse effect but it possibly could cause inadvertent premature release of the messengers and premature reversing of the Nansen bottles.

(d) Oceanic Instrumentation. Except for minor problems relating the spectrophotometer up and pairing cells for nutrient determinations, the standard analyses went smoothly. The data are considered to be of high quality.

(e) Biological Instrumentation.

1. A minutes sampling storm materials part prior to sailing provided the much needed capability for commanding discrete bottles. However, a problem does exist. The winch specifications required that the wire be organized at a 5 knot speed so that a depth of 200 meters could be obtained by letting out no more than 400 meters of cable. To stream and maintain this amount of cable required 45 minutes and the Bathy format requires 40 knots for this period of time. It was necessary to proceed at 6.5 knots which resulted in:

a. The desired depth not being reached. As assumed by a mathematical model in the net there the depths actually varied from 130 to 160 meters.

b. Delicate specimens were damaged upon through the ship was stopped while inserting the last 100 meters of cable so that the catch would not be dragged through the propeller wash.

2. Although hampered by the lack of required steady two knot ship speed, oblique tows, conducted from the hydro platform maintained well control in areas of strong subsurface currents which caused the pipe noticeably beneath the ship so that the desired 45° wire angle could not be maintained while trying to accelerate away from the ship. Rough weather caused the loss of one double net rig when the cable parted under the sudden increased loading caused by heavy rolling. Within these conditions permitted an additional four tows were not made for lack of loading the spare rig.

(f) Plankton and productivity Instrumentation.

1. The JOCF Loading machine, assembled in the former Pinguinbar and equipped to record conductivity temperature depth measurements while underway, functioned unreliably throughout the cruise. Hours were spent trying to determine the malfunction, but since no malfunction or trouble shooting manual was provided with the instrument, all work was fruitless. Although a complete record of surface discrepancy is lacking, periodic calibrations of the thermometer readings were logged and the bathy recorder chart to give a continuous record of water surface temperature.

2. In connection with the productivity measurements, the light incubator, designed to duplicate light intensities at predetermined depths was discovered cracked and the extra cloth coverings (used to duplicate the more deep-light intensities within the incubator) removed so that originally determined intensities would probably be no longer valid. The cloth coverings were washed and bleached, and then reapplied, so that although the intended calibration was not duplicated, samples were incubated daily with the hope that a correction factor could be determined and applied prior to data analysis by comparison with duplicate samples run with a good incubator. A second incubator was not received until analysis is underway, Could Also, so that approximately half of the productivity work was done with this suspect incubator.

(g) Miscellaneous Equipment. Items not universally provided for with miscellaneous equipment including an all-dry vacuum, pressure/vacuum, pH probe, and dry bath temperature differences and its temperature recording apparatus. Due to a lack of adequate electrical line information and a malfunctioning power supply for the all-dry vacuum, shipboard personnel were unable to set up the unit. No observations were taken for the first seven days. Upon arrival in Honolulu, however, a representative from Yokes and Flow Rite to take the repairs. He was unable to fix the air temperature recording apparatus, as part appeared not compatible using the active unit. The pressure/vacuum system, once operating, was well as did the pH point instrument. The all-dry vacuum power supply was replaced, however, the vacuum/pressure operation was unable to operationally. Although the vacuum pump offered adequate of operation satisfactorily, several of the filter cartridges at several times during the cruise showed increased failures, so that the amount of data collected will not be known until the file is developed.

(h) Radiocarbon Counting. The Radiocarbon Counting operated without serious malfunction throughout the cruise period, however the multiple trace used approximately 1 gal lower than expected. Five hundred obtained from surface samples and 100 mls, or less, before data can be analyzed, a correction factor will have to be calculated and applied.

(i) Expendable BT.

1. The Expendable BT's operation was satisfactory during most of the cruise, however, a total of all casts were aborted because of cockpit operation. The cable was eventually traced to a short in the interface system.

(j) Accomplishments.

(1) In consideration of the age of the ship cable and the length of cable it has been subjected to use hydrographic casting, it is recommended that consideration be given to cut off at least 2000 linear feet from the after end of this cable. This would insure acceptable load factors on cable for hydro operations. It is to be noted that this recommendation is not based on any physical evidence of deterioration or weakness.

(b) To improve the situation with regard to the ROV underwater work shielding the hull when being raised or lowered it is recommended that a modification be made to the A-frame and a new work platform be installed on the main deck as shown on the sketch, Enclosure 2. This configuration would be used only in conjunction with the ROV. If the part which is ever required for helicopter, the present arrangement would still be available.

(c) The difficulties encountered in making effective use of the 700-kH computer display has undue failure that the system has a serious shortcoming if real time data evaluation is necessary. In view of this it is recommended that the present 70 mm camera be replaced with a 200 mm unit.

(d) Since digital echosounder apparatus is not provided, it is recommended that an instrument technician, qualified in the repair of oceanographic instrumentation be assigned to the ship, at least for the duration of the longer voyages. At present most of the instrument's exceed the 1000-hour mtbf and can reasonably be considered. However, as time more failures will occur and data will be lost.

(e) In order to provide adequate time for installation and testing, it is recommended that all supplementary scientific equipment, to be employed on the next HYDROPAC cruise, be delivered to the vessel at least two weeks before the scheduled departure date, 20 January 1968.

(f) The quarters assigned to the civilian scientists and personnel in the enlisted berthing spaces of the ship's regularly assigned officers. Although no complaints were received from any of this group, it is the opinion of this command that the civilians furnished to ship are not necessarily of enlisted status. While this situation cannot be completely ameliorated it could be substantially relieved if the senior civilian scientist could be provided with private and suitable accommodations. At the very least this would be a positive indication of appreciation for services of the scientific group to the basic mission of the vessel. Enclosure 3 shows one suggestion for accomplishing this. It would provide a stateroom having approximately 70 square feet of deck space in an area presently allotted to the senior officers of the ships. This space, which was formerly used for radio beacon equipment, is not being utilized already used at present. The structural changes required consist of the removal of heavy sheet partitioning originally installed to support a now moved. Removal of this structure will not reduce the strength or seaworthiness of the ships. Bulkhead and supply ventilation, lighting fixtures, and installation of all necessary and the stateroom are already installed but would require minor modifications. Waterproof furniture, bedding and a work table would be required. It is recommended that this proposal, or any other that would accomplish the intended purpose, be established for planning and implementation during early 1968.

PART V - SUMMARY OF OPERATIONS (CONT)

(A) Evaluation of Data Collected.

(a) All scientific data collected was forwarded to the Coast Guard Oceanographic Unit, Washington, D.C. for further processing and analysis. A final evaluation of the quality of the information is not available at this time.

EDWARD P. BOYLE

Distr:
COMDT(CMC) (5)
COMLANTAREA (5)
COMPACAREA (5)
CGOU (12)

OCEANOGRAPHIC PROGRAM

LISTING OF THE VARIOUS STATIONS OCCUPIED

(LEGEND - Types of surveys made: CTD/STD - deep (latter) hydrowright; BTSEQ - bathymat (Nansen Cast); STD - salinity/temperature/depth recording system cast; DR - dip netting; XBT - expendable bathythermograph; SURF - surface plankton tow; BT - stereo-vision tow; CONT - continuous counts not plankton tow; LCC - Linen Cast. Position accuracy to miles.

STATION	POSITION	TYPE SURVEYS MADE	Time(Z) (Hours)	POSITION ACCURACY
47001	05-35N 077-01W	CTD/O, STD, DRET, BSEQ	013905	2
47002	05-44N 077-30W	XBT	020235	24
47003	05-50N 078-02W	CTD	020922	1
47004	05-54N 078-13W	XBT	020427	1
47005	06-05N 078-31W	CTD/O, STD, DRET, SURF, LC, LCC	020510	1
47006	06-13N 078-39W	XBT	020820	1
47007	06-20N 078-51W	STD	020859	1
47008	06-25N 078-41W	CTD/O, STD, DRET, SURF	030946	1
47009	06-47N 079-00W	XBT	021324	1
47010	06-47N 079-15W	XBT	021624	1
47011	06-58N 079-17W	CTD/O, STD, DRET, SURF, BT, LCC	021914	1
47012	06-56N 079-25W	XBT	022031	1
47013	07-02N 079-33W	STD	022120	1
47014	07-15N 079-43W	XBT	022320	24
47015	07-17N 079-48W	STD	022515	1
47016	07-15N 079-47W	XBT	030050	1
47017	07-05N 080-15W	STD	030150	1
47018	06-58N 080-54W	XBT	030459	1
47019	06-58N 080-54W	CTD/O, STD, DRET, BSEQ, BT	030620	1
47020	06-47N 080-46W	XBT	030908	1
47021	06-41N 080-53W	XBT	030945	1
47022	06-21N 080-41W	CTD/O, STD, DRET, SURF	031115	1
47023	06-09N 080-36W	XBT	031400	1
47024	06-01N 080-34W	STD	031459	24
47025	05-51N 080-32W	CTD/O, DRET, SURF, BT, LCC	031606	1
47026	05-30N 080-24W	XBT	031825	1
47027	05-16N 080-12W	XBT	032225	1
47028	04-57N 079-15W	CTD/O, STD, DRET, SURF, BT, LCC	040620	1
47029	04-50N 080-14W	BT (Night)	040750	1
47030	04-47N 080-07W	BT (Night)	040905	1
47031	04-41N 080-03W	BT (Night)	040925	1
47032	04-03N 079-51W	CTD/O, DRET, BSEQ	050830	1
47033	03-58N 079-49W	BT (Night)	051745	1
47034	03-49N 079-44W	CTD/O, DRET, SURF, BT, LCC	060430	1
47035	03-39N 079-39W	BT (Night)	071856	1
47036	03-32N 079-30W	CTD/O, STD, DRET, BSEQ	082000	1
47037	03-23N 079-25W	BT (Night)	082315	1
47038	03-03N 079-19W	STD	090010	24
47039	01-50N 079-14W	BT (Night)	092110	1
47040	01-38N 079-08W	CTD/O, STD, DRET, SURF, BT, DR, LCC	095030	1

FACILITIES (F)

STATION	POSITION	TYPE SERVICE AVAIL	TIME(Z)	POSITION ACCURACY
37047	01-36N 079-31W	ASR	050845	3
37052	01-37N 079-39W	ATCT	050841	3
37053	01-31N 079-52W	ATCT	050830	3
37064	01-27N 080-17W	ATCT	051012	3
37075	01-21N 080-34W	ATCT, ASR	051155	2
37076	01-47N 080-54W	ATCT	051330	2
37084	01-42N 081-15W	ATCT	051555	3
37085	01-05N 081-36W	ATCT	051732	2
37098	01-00N 082-00W	ATCT, TVOR, GCAT, ILOC	051935	3
37050	00-50N 082-00W	ATCT	052035	4
37051	00-40N 082-00W	ATCT	052230	4
37052	00-26N 081-58W	ATCT	052355	4
37053	00-12N 081-57W	D/ATCRBS, TACAN, GCAT, ILOC, ASR, MSN, ATCT	060025	4
37054	00-02S 081-54W	ATCT	060123	4
37055	00-16S 081-52W	ATCT	060726	4
37056	00-17S 081-35W	ATCT	060830	4
37057	00-03S 082-00W	TACAN, ATCT, GCAT, ILOC	060900	3
37058	00-32S 082-00W	ATCT	061111	2
37059	00-44S 082-00W	ATCT	061155	3
37060	01-00S 082-01W	ATCT	061315	2
37061	01-11S 082-02W	TACAN, ATCT, ILOC, ILOC, ASR, LOC	061400	2
37062	01-13S 082-02W	ATCT	061700	2
37063	01-26S 082-00W	ATCT	061801	3
37064	01-39S 081-59W	ATCT	061920	2
37065	01-48S 081-58W	RADAR, ATCT, TVOR, ILOC	062020	2
37066	01-57S 081-58W	ATCT	062230	3
37067	02-05S 081-58W	ATCT	062333	4
37068	02-18S 081-57W	ATCT	070040	3
37069	02-27S 081-58W	ATCT, TACAN, ATCT, ILOC, ASR	070150	3
37070	03-05S 082-01W	ATCT, D/ATCRBS, TACAN, GCAT, ILOC, MSN, ASR	092350	4
37071	03-21S 082-01W	ATCT	100045	3
37072	03-35S 082-01W	ATCT	100233	4
37073	03-47S 082-02W	ATCT	100423	4
37074	03-59S 082-02W	ATCT, TACAN, ILOC	101013	3
37075	04-10S 082-03W	ATCT	101217	3
37076	04-20S 082-03W	ATCT	101253	3
37077	04-30S 082-03W	ATCT	101355	3
37078	04-39S 082-03W	ATCT, TACAN, ILOC, GCAT, ASR, LOC	101430	3
37079	04-54S 082-03W	ATCT	101650	3
37080	05-09S 082-03W	ATCT	101830	2
37081	05-11S 082-03W	ATCT	102006	3
37082	05-21S 082-03W	ATCT, TACAN, ILOC, ILOC	102053	3
37083	05-37S 082-03W	ATCT	102230	3
37084	05-44S 082-03W	ATCT	102350	3
37085	05-56S 082-01W	ATCT	110010	3
37086	06-04S 082-00W	ATCT, TACAN, ILOC, ASR, LOC	110151	3
37087	06-17S 082-00W	ATCT	110252	3

Enclosure (1)

STATION	POSITION	VOR-VORTAC-MAP	RADIAL	POSITION ACCURACY
J7008	06-328 082-00W	SOD	110530	4
J7014	06-313 081-38W	XBT	110750	1
J7040	06-478 081-02W	WYNDO, STD, ODNT, SOD	110655	3
J7047	06-378 081-58W	ZOT	111110	3
J7052	07-078 081-38W	SFO	111307	3
J7053	07-123 081-07W	ZBT	111512	3
J7056	07-288 081-37W	JETRO, STD, ODNT, SOD, HO, ZBT	111400	3½
J7073	07-478 081-39W	SFO	111757	2
J7098	07-563 081-59W	ZOT	111946	1½
J7097	08-118 082-01W	IRTOO, STD, ODNT, SOD	112010	3
J7098	08-318 082-03W	XBT	112300	4
J7099	08-483 082-03W	ZYTOO, D/ZYTOO, STD, ODNT, SOD, HO, HO, XBT	112533	4
J7100	09-123 082-05W	XBT	112730	3
J7101	09-298 082-03W	ZYTOO, SFO, ODNT, SOD	112930	4
J7102	09-438 082-07W	ZBT	113114	3
J7103	10-098 082-09W	IRTOO, SFO, ODNT, SOD, HO, ZBT	113400	3
J7104	10-018 081-48W	ZOT	113615	3
J7105	10-228 081-34W	IRTOO, STD, ODNT, SOD	113100	3
J7106	09-568 081-10W	ZOT	113220	4
J7107	09-208 080-53W	IRTOO, D/ZYTOO, STD, ODNT, SOD, HO, ZBT	113000	4
J7108	09-408 080-30W	ZOT	113715	4
J7109	09-358 080-15W	IRTOO, STD, ODNT, SOD	113855	4
J7110	09-298 080-03W	ZOT	114139	3
J7111	09-278 079-55W	SFO	114300	3
J7112	09-218 079-37W	ZOT	114514	3
J7113	09-228 079-29W	IRTOO, STD, ODNT, SOD, HO, ZBT	114600	3½
J7114	09-408 079-27W	SFO	114804	4
J7115	09-578 079-19W	SFO	114934	3
J7116	10-158 079-05W	SFO	115130	4
J7117	10-208 078-59W	SFO	115259	4
J7018	10-228 078-48W	SFO	115600	4
J7119	10-338 078-30W	SFO	115855	4
J7120	11-078 078-30W	SFO	120145	5
J7121	11-238 078-19W	SFO	120500	4
J7122	11-348 078-03W	SFO	120820	3
J7123	11-478 077-38W	SFO	121000	3½
J7124	12-138 077-25W	HIGHN, SFO, ODNT, SOD	121035	3
J7125	12-158 077-13W	ZOT	122250	3½
J7126	12-188 077-03W	SFO	122455	3½
J7127	12-238 076-45W	SFO	122655	3½
J7128	12-288 076-30W	SFO, D/SFO, HO, ODNT, SOD, HO, ZBT	122915	3½
J7129	12-348 076-22W	SFO	123040	3
J7130	12-408 076-07W	SFO	123203	4
J7131	12-428 075-49W	SFO	123423	4
J7132	12-448 075-32W	SFO, ZBT, SOD, SOD	123630	4
J7133	12-508 075-16W	SFO	123840	4

SATELLITE [1]

STATION	POSITION	TYPE EQUIPMENT MADE	TIME(A)	POSITION ACCURACY
A7134	12-568 079-26A	XIMDO, STD, DOMT, IMDO, PO, LES	171400	½
A7135	13-026 079-20A	IXT	171605	2
A7136	13-058 079-36A	IXT	171640	2½
A7137	13-108 080-13A	XIMDO, STD, DOMT, XMDT	172020	2
A7138	13-168 080-36A	IXT	172325	3
A7139	13-278 081-01A	XIMDO, STD, DOMT, XMDT, PM, LES	180020	4
A7140	13-338 081-22A	IXT	180625	4
A7141	13-388 081-42A	XIMDO, STD, DOMT, XMDT	180750	4
A7142	13-518 082-11A	XMT	181139	3
A7143	13-588 082-22A	XIMDO, STD, DOMT, XMDT, PO, LES	181335	2½
A7144	14-098 082-47A	IXT	181740	2½
A7145	14-188 083-05A	XIMDO, STD, DOMT, XMDT	181925	2
A7146	14-268 083-20A	IXT	182300	2
A7147	14-278 083-41A	D/XIMDO, XIMDO, STD, XMT, DOMT, XMDT, PO, LES	190005	2½
A7148	14-398 084-06A	IXT	190745	3
A7149	14-438 084-21A	IXIMDO, STD, DOMT, XMDT	190925	4
A7150	14-488 084-38A	IXT	191200	3
A7151	14-565 085-00A	XIMDO, STD, DOMT, XMDT, PO, LES	191460	2½
A7152	14-328 085-02A	IXT	191830	3
A7153	14-478 085-03A	XIMDO, STD, DOMT, XMDT	192000	3
A7154	13-558 085-02A	IXT	192305	3½
A7155	13-358 085-03A	XIMDO, STD, DOMT, XMDT, PO, LES	200110	2½
A7156	13-068 085-04A	IXT	200530	2
A7157	13-448 085-07A	D/XIMDO, XIMDO, STD, DOMT, XMDT	200715	2
A7158	13-268 085-03A	IXT	201308	3½
A7159	13-078 084-35A	XIMDO, STD, DOMT, XMDT, PO, LES	201430	3
A7160	13-568 085-00A	IXT	201510	3½
A7161	11-468 085-01A	IXT	201910	2½
A7162	11-308 085-01A	XIMDO, STD, DOMT, XMDT	202040	3
A7163	11-088 085-03A	IXT	202320	4
A7164	10-438 085-04A	XIMDO, D/XIMDO, STD, DOMT, XMDT, PO, LES	210120	4
A7165	10-208 085-05A	IXT	210307	4
A7166	10-018 085-05A	XIMDO, STD, DOMT, XMDT	210450	4
A7167	09-388 085-02A	IXT	211412	3
A7168	09-178 085-07A	XIMDO, STD, DOMT, XMDT, PO, LES	211620	3
A7169	09-028 085-06A	IXT	211751	3
A7170	08-918 085-04A	IXT	211955	3
A7171	08-358 085-02A	XIMDO, STD, DOMT, XMDT	212054	3½
A7172	08-178 083-03A	IXT	212358	4
A7173	07-598 085-09A	XIMDO, STD, DOMT, XMDT, PO, LES	220100	4
A7174	07-348 085-03A	IXT	220626	4
A7175	07-168 085-07A	XIMDO, STD, DOMT, XMDT	220840	4
A7176	06-968 085-02A	IXT	221154	3½
A7177	06-358 085-07A	XIMDO, STD, DOMT, XMDT, PO, LES	221400	3
A7178	06-098 085-03A	IXT	221634	3
A7179	05-908 085-07A	XIMDO, STD, DOMT, XMDT	222000	3
A7180	05-328 085-07A	IXT	222200	4

CHALLENGE (1)

STATION	POSITION	TYPE SURVEY MARK	TIME(Z)	POSITION ACCURACY
47181	05-173 085-011W	U/STAMPED, MT0180, 0057, SURV, NM, MK, STA	230042	4
47182	05-055 085-030W	MON	230625	4
47183	04-528 085-07W	STD	230645	4
47184	04-438 085-030W	MON	230900	5
47185	04-298 085-031W	STAMPED, STD, CONC, MARK	231000	5
47186	04-158 084-59W	MON	231225	4
47187	04-028 084-59W	STD	231312	4
47188	03-598 085-000W	MON	231414	3
47189	03-518 085-01W	STAMPED, STD, CONC, SURV, NM, MON	231900	2
47190	03-368 085-011W	MON	231920	3
47191	03-228 085-012W	STD	231923	1
47192	03-128 085-013W	MON	232038	3
47193	02-598 085-01W	STAMPED, STD, CONC, SURV	232140	3
47194	02-478 085-01W	MON	232355	3
47195	02-388 085-011W	STD	240020	3
47196	02-228 085-00W	MON	240204	4
47197	02-108 085-03W	STAMPED, STD, DISC, SURV, NM, MK, MON	240500	4
47198	01-568 085-02W	MON	240638	4
47199	01-508 085-031W	STD	240725	4
47200	01-288 085-031W	MON	240830	4
47201	01-268 085-04W	STAMPED, STD, CONC, SURV	240840	4
47202	01-128 085-02W	MON	241207	4
47203	01-038 085-04W	STD	241257	3
47204	00-518 085-04W	MON	241405	3
47205	00-408 085-04W	STAMPED, STD, CONC, SURV, NM, MON	241500	2
47206	00-268 085-03W	MON	241805	3
47207	00-178 085-02W	STD	241910	2
47208	00-098 085-00W	MON	242000	3
47209	00-028 084-59W	STAMPED, STD, CONC, SURV	242100	3
47210	00-118 084-58W	MON	242307	4
47211	00-238 084-58W	STD	242355	4
47212	00-368 084-58W	MON	250054	4
47213	00-478 084-57W	STAMPED, U/STAMPED, STD, CONC, STD, NM, MK, MON	250145	5
47214	01-008 084-57W	MON	250706	4
47215	01-098 084-56W	STD	250810	4
47216	01-208 084-57W	MON	250925	4
47217	01-318 084-58W	STAMPED, STD, CONC, SURV	251001	3
47218	01-438 084-58W	MON	251059	3
47219	01-548 084-59W	STD	251207	3
47220	02-038 085-00W	MON	251433	3
47221	02-088 085-00W	STAMPED, STD, CONC, SURV, NM, MON	251500	3
47222	02-188 085-01W	MON	251757	2
47223	02-298 085-01W	STD	251900	2
47224	02-388 085-02W	MON	252020	3
47225	02-538 085-02W	STAMPED, STD, CONC, SURV	252130	3
47226	03-058 085-03W	MON	260005	3
47227	03-178 085-03W	STD	260108	3

IDENTIFIER	POSITION	ITEM SEQUENCE NAME	ITEM(S)	POSITIVE ASSURANCE
07238	03-411 060-559	ILE	260705	1
07239	03-395 061-040	ITEMS, SEQ, CONT, SING, IN, DA, LET	260395	3
07230	03-451 061-337	ILE	260544	1
07231	03-363 062-020	SEQ	260729	1
07232	04-078 062-511	LET	260835	1
07233	04-211 062-477	ITEM, SEQ, CONT, DATE	260930	1
07234	04-268 062-477	ILE	261000	1
07235	04-438 063-043	SEQ	261043	1
07236	04-368 063-130	CONT	261210	1
07237	05-078 064-058	ITEMS, SEQ, CONT, LOOP, IN, ILE	261500	3
07238	05-178 064-407	ILE	261800	1
07239	05-263 064-508	ILE	261827	1
07240	05-438 064-578	ITEMS, SEQ, CONT, LOOP	262030	1
07241	06-088 065-078	ILE	262300	1
07242	06-218 065-337	F/ITEMS, ITEMS, SEQ, CONT, LOOP, IN, DA, LET	270110	1
07243	06-428 065-580	LET	270644	1
07244	06-578 066-058	ITEMS, SEQ, CONT, LOOP	270845	1
07245	07-198 066-258	LET	271020	1
07246	07-438 066-428	ITEMS, SEQ, CONT, LOOP, IN, DEC	271300	3
07247	07-568 066-458	ILE	271301	1
07248	08-018 067-268	ILE	271900	1
07249	08-178 067-458	ILE	272027	1
07250	08-278 068-058	ITEMS, SEQ, CONT, LOOP	272130	1
07251	08-378 068-088	LET	272328	1
07252	08-428 068-178	ILE	280030	3
07253	08-518 068-458	LET	280115	3
07254	08-578 069-018	ITEMS, SEQ, CONT, LOOP, IN, DEC	280300	3
07255	09-088 069-278	ILE	280527	1
07256	09-178 069-358	SEQ	280623	1
07257	09-228 069-538	LET	280710	1
07258	09-328 069-538	ITEMS, SEQ, CONT, LOOP	280730	1
07259	09-598 069-528	SEQ	280300	1
07260	10-138 069-588	SEQ	310015	1
07261	10-258 069-578	SEQ	310054	1
07262	10-418 069-638	SEQ	310059	1
07263	10-478 069-678	SEQ	310520	1
07264	11-068 069-678	SEQ	310705	1
07265	11-228 069-618	SEQ	310845	1
07266	11-368 069-668	SEQ	311010	1
07267	11-508 069-678	SEQ	311140	1
07268	11-658 069-698	ITEMS, SEQ, CONT, LOOP, IN, DEC	311435	3
07269	11-708 069-728	SEQ	311600	1
07270	11-828 069-768	SEQ	311915	1
07271	11-918 069-788	SEQ	312000	1
07272	11-978 069-818	ITEMS, SEQ, CONT, LOOP	312130	1
07273	12-138 069-868	SEQ	312330	1
07274	12-228 069-898	SEQ	312500	1
07275	12-318 069-938	SEQ	312615	1

Enclosure (1)

STATION	POSITION	TYPE SURVEY MADE	TIME(S)	DISTANCE ASSIGNED
A7276	10-50N 068-10W	L/DIRD, DIRD, DYD, XEY, DSFC, SURF, MA, LEC	010920	5
A7277	10-54N 068-14W	QUE	010932	5
A7278	10-21N 068-15W	DIRD, DYD, YSFC, SUR	011005	4
A7279	09-59N 068-15W	DUE	011429	4
A7280	09-50N 068-17W	DIRD, WED, DSFC, SURF, MA, LEC	011555	3
A7281	09-40N 068-17W	XBT	011908	3
A7282	09-27N 068-10W	XBT	012010	2½
A7283	09-06N 068-04W	DIRD, DYD, DSFC, SURF	012200	2
A7284	08-57N 068-03W	XBT	012602	2½
A7285	08-44N 067-59W	XBT	020107	3
A7286	08-45N 067-58W	DIRD, DYD, DSFC, SURF, MA, LEC	020340	3
A7287	07-51N 067-48W	XBT	020813	4
A7288	07-29N 067-44W	DIRD, DYD, DSFC, SURF	021030	3
A7289	07-23N 067-41W	XBT	021215	3
A7290	06-47N 067-57W	DIRD, DYD, DSWI, SURF, MA, LEC	021610	3½
A7291	06-21N 067-37W	XBT	022030	3
A7292	05-52N 067-37W	DIRD, SYD, DSFC, SURF	022215	4
A7293	05-37N 067-37W	XBT	022604	4
A7294	05-30N 067-37W	XBT	023130	4
A7295	05-16N 067-37W	DIRD, D/DIRD, DYD, DSFC, SURF, MA, MA, LEC	023615	4
A7296	05-00N 067-34W	XBT	024215	4
A7297	04-38N 067-30W	DIRD, SYD, DSFC, SURF, MA, LEC	024700	4
A7298	04-23N 067-29W	XBT	024815	4
A7299	04-13N 068-02W	XBT	025904	4
A7300	04-10N 068-02W	XBT	031000	4
A7301	04-00N 068-02W	DIRD, SYD, DSFC, SURF	031045	4
A7302	03-51N 068-05W	XBT	031330	3
A7303	03-38N 068-04W	XBT	031430	3
A7304	03-22N 068-04W	DIRD, SYD, DSFC, SURF, MA, LEC	031715	2½
A7305	03-02N 068-02W	XBT	031910	2½
A7306	02-45N 067-59W	DIRD, SYD, DSFC, SURF	032050	2½
A7307	02-34N 067-59W	XBT	032255	3
A7308	02-24N 068-00W	XBT	032550	3
A7309	02-13N 068-02W	XBT	032836	3
A7310	02-00N 068-02W	DIRD, D/DIRD, DYD, DSFC, SURF, MA, MA, LEC	033145	4
A7311	01-48N 068-01W	XBT	033500	4
A7312	01-42N 068-01W	XBT	033655	4
A7313	01-28N 068-01W	XBT	034005	4
A7314	01-18N 068-02W	DIRD, DYD, DSFC, SURF	034245	3
A7315	01-02N 068-02W	XBT	034535	3
A7316	00-51N 068-02W	XBT	034835	3½
A7317	00-38N 068-03W	XBT	035305	3
A7318	00-24N 068-02W	DIRD, SYD, DSWI, ASST, MA, LEC	035600	3½
A7319	00-12N 068-02W	XBT	035750	3
A7320	00-00N 068-02W	XBT	040000	3
A7321	00-04S 068-02W	XBT	040200	3
A7322	00-16S 068-02W	DIRD, DYD, DSFC, SURF	040400	3

STATION	DESCRIPTION	TIME SERVICES MADE	TIME(S)	POSITION ACCURACY
A7322	00-240 026-07W	XBT	050235	4
A7323	00-360 028-05W	XBT	060036	5
A7324	00-480 028-03W	XBT	060659	5
A7325	00-595 028-07W	XBTXO, STD, CONT, SURF, MM, LOC	060905	4
A7326	01-060 028-04W	XBT	060635	4
A7327	01-240 028-01W	XBT	060734	3
A7328	01-360 028-07W	XBT	060835	3
A7329	01-480 028-04W	XBTXO, STD, CONT, SURF	060935	3
A7330	01-595 028-01W	XBT	061035	
A7331	02-075 028-07W	XBT	061505	3
A7332	02-180 028-04W	STD	061630	
A7333	02-285 028-01W	XBT	061900	2
A7334	02-345 027-07W	XCTDO, STD, CONT, SURF, MM, LOC	061812	
A7335	02-360 027-04W	XBT	061937	3
A7336	02-480 027-02W	XBT	062040	
A7337	02-595 027-03W	XBT	062120	2
A7338	03-045 027-04W	XBTXO, XBT, CONT, SURF	062327	
A7339	03-150 027-04W	XBT	070005	
A7340	03-240 027-04W	XBT	070054	
A7341	03-330 028-04W	XBT		
A7342	03-480 028-04W	B/XCTDO, XCTDO, STD, CONT, SURF, MM, LOC	070209	4
A7343	04-020 028-03W	XBT	070735	
A7344	04-060 027-59W	STD	070816	4
A7345	04-295 027-57W	XCTDO, STD, CONT, SURF	071000	3
A7346	04-360 027-59W	XBT	071237	
A7347	04-480 027-59W	STD	071325	4
A7348	04-595 028-02W	XBT	071433	
A7349	05-105 028-03W	XCTDO, STD, CONT, SURF, MM, LOC	072540	3
A7350	05-355 028-00W	CTD	073015	
A7351	05-535 027-59W	XCTDO, STD, CONT, SURF	072210	3
A7352	05-595 027-59W	XBT	072559	
A7353	06-165 027-59W	XBT	080123	
A7354	06-375 027-59W	XCTDO, STD, CONT, SURF, MM, LOC	080320	4
A7355	06-475 028-00W	XBT	080613	
A7356	06-595 028-00W	XBT	080727	
A7357	07-165 028-01W	XCTDO, STD, CONT, SURF	080910	3
A7358	07-375 028-02W	XBT	081224	
A7359	08-075 028-03W	XCTDO, STD, CONT, SURF, MM, LOC	081515	3
A7360	08-265 028-00W	XBT	081825	
A7361	08-345 028-01W	XBT	081915	
A7362	08-595 028-02W	XCTDO, STD, CONT, SURF	082120	4
A7363	09-175 028-03W	XBT	090030	
A7364	09-405 028-02W	XCTDO, STD, CONT, SURF, MM, LOC	090330	4
A7365	09-595 028-02W	XBT	090610	
A7366	10-075 028-02W	XBT	090720	
A7367	10-225 028-03W	XCTDO, STD, CONT, SURF	090900	4
A7368	10-420 028-03W	XBT	091202	
A7369	11-020 027-59W	XCTDO, STD, CONT, SURF, MM, LOC	091430	4
A7370	11-375 027-59W	XBT	091650	
A7371	11-485 028-00W	XCTDO, STD, CONT, SURF	091930	4

STATION	POSITION	SYS SURVEYS RUN	TIME(Z)	POSITION ACCURACY
A7372	12-002 082-12W	XBT	092355	
A7373	12-318 082-03W	D/GECHO, STD, HYDRO, CHEM, CURR MET, LEX	100205	3
A7374	12-319 083-03W	CTD	100645	
A7375	12-338 083-02W	XBT	100830	
A7376	13-143 083-01W	HYDRO, STD, CHEM, CTD	101000	4
A7377	13-278 083-00W	XBT	101233	
A7378	13-438 087-58W	XBT	101400	
A7379	13-578 087-57W	HYDRO, STD, CHEM, CTD, MET, LEX	101529	2
A7380	14-138 087-57W	XBT	101840	
A7381	14-318 087-58W	XBT	102018	
A7382	14-478 087-59W	HYDRO, STD, CHEM, CTD	102150	3
A7383	14-578 088-16W	STD	110039	3
A7384	14-578 088-30W	CTD	110228	4
A7385	14-583 088-59W	STD	110411	4
A7386	14-598 089-20W	STD	110634	5
A7387	14-598 089-40W	STD	110748	5
A7388	14-598 090-01W	STD	110930	5
A7389	15-008 090-23W	STD	111100	4
A7390	15-008 090-43W	STD	111315	4
A7391	15-008 091-07W	STD	111510	3
A7392	14-578 091-28W	STD	111700	3
A7393	14-578 091-50W	STD	111850	3
A7394	14-588 092-10W	STD	112035	4
A7395	14-598 092-31W	STD	112223	3
A7396	14-598 092-52W	STD	120018	3
A7397	15-008 093-14W	STD	120157	2
A7398	14-598 093-34W	STD	120340	3
A7399	14-598 093-54W	STD	120525	4
A7400	14-598 094-15W	STD	120710	4
A7401	14-598 094-38W	STD	120859	4
A7402	14-588 095-01W	HYDRO, STD, CHEM, CTD	121100	5
A7403	14-378 095-03W	XBT	121410	
A7404	14-178 095-05W	HYDRO, STD, CHEM, MET, LEX	121559	3
A7405	13-058 095-03W	XBT	121836	
A7406	13-318 095-05W	XBT	121955	
A7407	13-378 095-02W	HYDRO, STD, CHEM	122129	4
A7408	13-138 095-01W	XBT	122349	
A7409	12-378 095-03W	XBT	130112	
A7410	12-518 095-59W	D/GECHO, HYDRO, STD, CHEM, MET, LEX	130230	4
A7411	12-378 095-05W	CTD	130408	
A7412	12-218 095-05W	XBT	130725	
A7413	12-038 095-01W	HYDRO, STD, CHEM	130900	4
A7414	11-368 095-03W	XBT	131145	
A7415	11-378 095-05W	HYDRO, STD, CHEM, CHEM, MET, LEX	131353	3
A7416	10-138 095-05W	XBT	131800	
A7417	10-348 095-05W	XBT	131920	
A7418	10-038 095-03W	XBT	132040	
A7419	09-428 095-05W	XBT	132150	
A7420	09-268 095-03W	XBT	132315	

STATION	POSITION	TYPE SURVEY MADE	TIME(S)	POSITION ACCURACY
47421	09-058 095-02W	XBT	140042	
47422	08-458 095-02W	XBT	140200	
47423	08-248 095-03W	XBT	140320	
47424	08-058 095-03W	XBT	140437	
47425	07-468 095-02W	XBT	140555	
47426	07-268 095-02W	XBT	140715	
47427	07-068 095-02W	XBT	140838	
47428	06-488 095-02W	XBT	141004	
47429	06-258 095-02W	XBT	141120	
47430	05-278 095-03W	HYDRO, STD, CONT, SURF, BT, LST	150320	4
47431	05-058 095-01W	XBT	150735	
47432	10-158 095-02W	HYDRO, STD, CONT, SURF	150938	4
47433	05-468 095-02W	XBT	151225	
47434	05-268 095-02W	XBT	151440	
47435	04-428 095-01W	XBT	151602	
47436	04-228 095-02W	HYDRO, STD, LST, CONT, SURF	151900	3
47437	04-048 095-05W	XBT	152250	
47438	07-408 095-05W	U/HYDRO, HYDRO, STD, LST, BT, CONT, SURF	160055	1
47439	07-078 095-05W	XBT	160740	
47440	06-468 095-05W	HYDRO, STD, CONT, SURF	160945	4
47441	06-278 095-05W	XBT	161230	
47442	06-128 095-04W	XBT	161348	
47443	05-558 095-06W	HYDRO, STD, LST, BT, CONT, SURF	161515	3
47444	05-388 095-07W	XBT	161845	
47445	05-208 095-06W	XBT	162015	
47446	05-028 095-06W	HYDRO, STD, CONT, SURF	162153	3
47447	04-518 095-05W	XBT	170003	
47448	04-328 095-06W	STD	170103	9
47449	04-268 095-03W	XBT	170213	
47450	04-178 095-01W	HYDRO, STD, LST, BT, CONT, SURF	170306	3
47451	03-598 095-01W	XBT	170620	
47452	03-508 095-01W	STD	170719	4
47453	03-388 095-01W	XBT	170827	
47454	03-278 095-01W	HYDRO, STD, CONT, SURF	170926	3
47455	03-158 095-00W	XBT	171145	
47456	03-028 095-00W	STD	171242	1
47457	02-518 095-00W	XBT	171345	
47458	02-418 095-00W	HYDRO, STD, LST, BT, CONT, SURF	171452	3
47459	02-268 095-01W	XBT	171725	
47460	02-198 095-01W	STD	171842	3
47461	02-058 095-02W	XBT	171940	
47462	01-568 095-03W	HYDRO, STD, CONT, SURF	172050	4
47463	01-438 095-03W	XBT	172307	
47464	01-348 095-03W	STD	172358	4
47465	01-188 095-02W	XBT	180108	
47466	01-018 095-00W	HYDRO, U/HYDRO, STD, LST, BT, CONT, SURF	180210	2
47467	00-578 095-01W	XBT	180357	
47468	00-438 095-00W	STD	180512	4

STATION	POSITION	TYPE-DENSITY-FAUN	TIME(S)	POSITION ACCURACY
47460	00-33S 095-05W	XBT	181015	
47470	00-32S 095-09W	MBTBO, STD, OCST, SHIP	181055	1
47471	00-13S 095-10W	XBT	181323	
47472	00-05S 095-09W	STD	181410	1
47473	00-11S 095-08W	XBT	181532	
47474	00-25S 095-07W	MBTBO, STD, TAI, WI, OSCI, OSCT	181650	3
47475	00-37S 095-10W	XBT	182000	
47476	00-42S 095-08W	STD	182044	3
47477	00-36S 095-06W	XBT	182150	
47478	01-05S 096-59W	MBTBO, STD, OCST, SHIP	182240	1
47479	01-16S 096-56W	XBT	190109	
47480	01-29S 096-53W	STD	190200	1
47481	01-39S 096-51W	XBT	190307	
47482	01-48S 096-49W	BUOYO, STD, TAI, WI, OSCI, SHIP	190300	1
47483	02-02S 096-46W	XBT	190706	
47484	02-09S 096-43W	STD	190754	1
47485	02-22S 096-43W	XBT	190910	
47486	02-33S 096-42W	BUOYO, STD, OSCI, SHIP	191000	1
47487	02-42S 096-41W	XBT	191215	
47488	02-55S 096-39W	STD	191308	1
47489	03-06S 096-41W	XBT	191615	
47490	03-16S 096-43W	MBTBO, STD, LEI, WI, OSCI, SHIP	191504	3
47491	00-28S 096-42W	XBT	191800	
47492	03-36S 096-51W	STD	191908	2
47493	03-47S 096-53W	XBT	192003	
47494	03-58S 096-55W	MBTBO, STD, OCST, SHIP	192058	3
47495	04-11S 096-55W	XBT	192255	
47496	04-21S 096-59W	STD	192342	1
47497	04-33S 096-57W	XBT	200053	
47498	04-44S 096-56W	D/MTBO, BUOYO, OCST, SHIP, STD, WI, LEI	200035	1
47499	05-46S 096-58W	XBT	200548	
47500	05-47S 096-58W	XBT	200745	
47501	05-56S 095-59W	MBTBO, STD, OCST, SHIP	200745	1
47502	05-54S 096-57W	XBT	201247	
47503	06-02S 096-58W	XBT	201430	
47504	06-07S 096-59W	MBTBO, STD, LEI, WI, OSCI, OSCT	201525	1
47505	06-16S 096-59W	XBT	201830	
47506	07-05S 096-57W	XBT	202015	
47507	07-14S 096-58W	MBTBO, STD, OSCI, SHIP	202125	3
47508	07-40S 095-00W	XBT	210026	
47509	08-05S 095-02W	MBTBO, STD, LEI, WI, OSCI, OSCT	210220	3
47510	08-15S 095-03W	XBT	210625	
47511	08-27S 095-04W	BUOYO, STD, OSCI, SHIP	210839	1
47512	09-02S 095-04W	XBT	211200	
47513	09-09S 095-05W	MBTBO, STD, OSCI, SHIP, LEI, WI	211345	3
47514	10-48S 095-05W	XBT	211805	
47515	10-47S 095-06W	MBTBO, STD, OSCI, SHIP	212054	3
47516	11-11S 095-07W	XBT	212329	
47517	11-26S 095-07W	MBTBO, D/MTBO, STD, LEI, WI, OSCI, SHIP	220130	2

Locations (1)

STATION	POSITION	TYPE SURVEYS MADE	ZONE(S)	POSITION ACCURACY
47518	11-538 095-024	XBT	230637	
47519	12-094 094-599	XBT	220744	
47520	12-338 094-578	XTDO, STD, DWTT, ESTD	230942	4
47521	12-478 094-598	XBT	221205	
47522	13-038 095-004	XBT	221515	
47523	13-168 095-018	XTDO, STD, XBT, MT, DWTT, DWTC	221618	3
47524	13-458 095-038	XBT	221825	
47525	14-118 095-018	XTDO, STD, DWTT, ESTD	222030	3
47526	14-398 095-038	XBT	222245	
47527	15-008 094-598	XTDO, STD, DWTT, PPBT, XBT, MT	230125	4
47528	14-518 094-338	XBT	230207	
47529	14-468 093-198	XBT	230625	
47530	14-408 093-368	XBT	230745	
47531	14-348 093-378	XBT	230910	
47532	14-288 093-198	XBT	231022	
47533	14-238 093-038	XBT	231140	
47534	14-178 093-008	XBT	231300	


WEST LONGITUDE
NORTH
EASTROPAC II
ROCKAWAY CRUISE TRACKS
LA UNION
PUNTARENAS
ACAPULCO
GUAYAQUIL
CALLAO
10°
0°

EXHIBIT D

Pivot Pin (A) and Clamp Screw (B) are pressed-fit into Casting (C). If the pressed-fit on either (A) or (B) works loose, the Nansen bottle, the thermometer case, and the thermometers are lost. Drilling of the Casting (C) and installation of the Taper Pins (D) prevents this type of failure.

ENCLOSURE III

USGS ROCKAWAY WRD-313	
MODIFICATION TO NANSEN BOTTLE	
NO SCALE	5 OCT. 1967

USCGC ROCKAWAY

OCEANO. STATION POSITION REPORT

DATE	

STATION	NO _____ (NO/SHIP _____)
TIME	STATION COMMENCED _____ LZT (ZONE ___) STATION COMPLETED _____ LZT TIME ON STATION ____ HRS. ____ MINS.
POSITION	LATITUDE _____ LONGITUDE _____ ESTIMATED ACCURACY ± ____ MILES

_____
O. O. D.

_____
NAVIGATOR

USCGC ROCKAWAY WAGO-377	
PROPOSED MODIFICATIONS TO STD HANDLING SYSTEM	
SCALE 1/8" = 1'	5 OCT 1967

ENCLOSURE X

(1) REMOVE W.T. BULK-HEAD AND W.T. DOOR

(2) REMOVE DEEP WEB BEAMS FROM OVER-HEAD

(3) REMOVE W.T. DOOR AND COAMING

BEFORE

MAIN DECK FRAMES 29-44

(4) INSTALL TWO PORT LIGHTS

(5) INSTALL JOINER BULKHEAD AND INNER DOOR

(6) INSTALL ARCH-WAY

AFTER

USCGC POLEMARCH WMEC-627

PROPOSED SR. SCIENTIST QUARTERS

SCALE 1/8" = 1'

5 OCT 67

ENCLOSURE (3)

Date 31 July 1967 Ship Rockaway (WAGO 377) Cruise No. 47

Organization USCG-C Recorder

Sunrise: Time ~~0606~~ Position: Lat. —, Long. — ~~-7N~~

Sunset: Time 1837 Position: Lat. 08°34.5' Long. 79°28'W

Miles travelled from 0000 hours to sunrise = —

Miles travelled from sunrise to sunset = —

Miles travelled from sunset to 2400 hours = 56.3mi

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	~~0800~~		~~6°35.0N~~	~~78°24.0'W~~
2.	~~1200~~		~~5°5~~	
3.				
4.	1830	range-brg-radar	08°34.5N	79°28W
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100						
0200						
0300						
0400						
0500						
0600						
0700						
0800						
0900						
1000						
1100						
1200						
1300						
1400						
1500						
1600	Redman	Naval Base Canal Zone				
1700	08°49.5	79°29.5	300	03	195	2
1800	08 39	79°25.5	300	02	195	2
1900	08 27	79°19	300	02	195	2
2000	08°16.7'	79°13.7'	003	13	195	2
2100	08°2.2	79°09.8'	003	13	195	2
2200	07°58.8N	79°5.2W	003	13	195	2
2300	07°50.8N	79°01.3W	355	11	195	2
2400	07°38.2N	7.9°55.2W	055	10		

Date 1 AUG 1967 Ship ROCKAWAY (WSTT) Cruise No. ____

Organization USCG Recorder ____

Sunrise: Time 0608 Position: Lat. 06 54, Long. 78 31 LAN

Sunset: Time 1837 Position: Lat. 05 38, Long. 77 48

Miles travelled from 0000 hours to sunrise = 57

Miles travelled from sunrise to sunset = 108.8

Miles travelled from sunset to 2400 hours = 23

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0806	Elestial Electronic	6°35'N	78°24'W
2.	1206	Electronic	5°54.7'N	78°05'W
3.	2606	Electronic	5°39.5'N	77°47.0'W
4.	2400	11	6°02N	78°19.5W
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	07°28.5N	78°50.8W	055	10	—	—
0200	07°20.5N	78°46.8W	125	15	—	—
0300	07°11.6N	78°42.2W	150	11	—	—
0400	07 10	78 37 W	150	5	150	1
0500	07 05	78 34	135	8	150	1
0600	06 54	78 31	115	7	220	2
0700	6°43'	78°27.5	215	6	230	1
0800	6°35'	78° 24'	215	6	230	1
0900	6°22.2'	78°19.5'	215	6	230	1
1000	6°14.5'N	78°14.2	191	6	230	1
1100	6°06'N	78°10.1'W	191	6	230	1
1200	5°54.1N	78°05 W	180	6	245	1
1300	5°47 N	78°02W	170	5	210	1
1400	5°34.6N	77°51W	170	5	210	1
1500	5°32.5N	77°51 W	210	5	210	1
1600	05 38	77 48	245	5	210	1
1700	CON	STATION	245	7	245	1
1800	"	"	240	6	245	1
1900	"	"	—	—	245	1
2000	5°39'N	77°47'W	240	10	245	1
2100	5°42.3'N	77°54'W	240	10	245	1
2200	5°49.2'N	78°03'W	240	10	245	1
2300	5 49.6N	78° 06.4W	240	10	245	1
2400	6°02N	78°19.5W	240	10	—	—

Date 24 AUG 67 Ship ROCKAWAY (WSTT) Cruise No. ____

Organization USCG Recorder ____

Sunrise: Time 0609 Position: Lat. 06 25, Long. 78 41 LAN 1220

Sunset: Time 1837 Position: Lat. 07°12', Long. 79 49

Miles travelled from 0000 hours to sunrise = 8.5

Miles travelled from sunrise to sunset = 73

Miles travelled from sunset to 2400 hours = 72.3 [illegible]

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	Electronic	6°38'N	78°56'W
2.	0000 3AUG		7°N	80°57'W Radar.
3.				
4.	1844	Radio range visual brg	07°15'	79 53
5.	2000	Visual - Radar	7°08'N	80°12.5'W

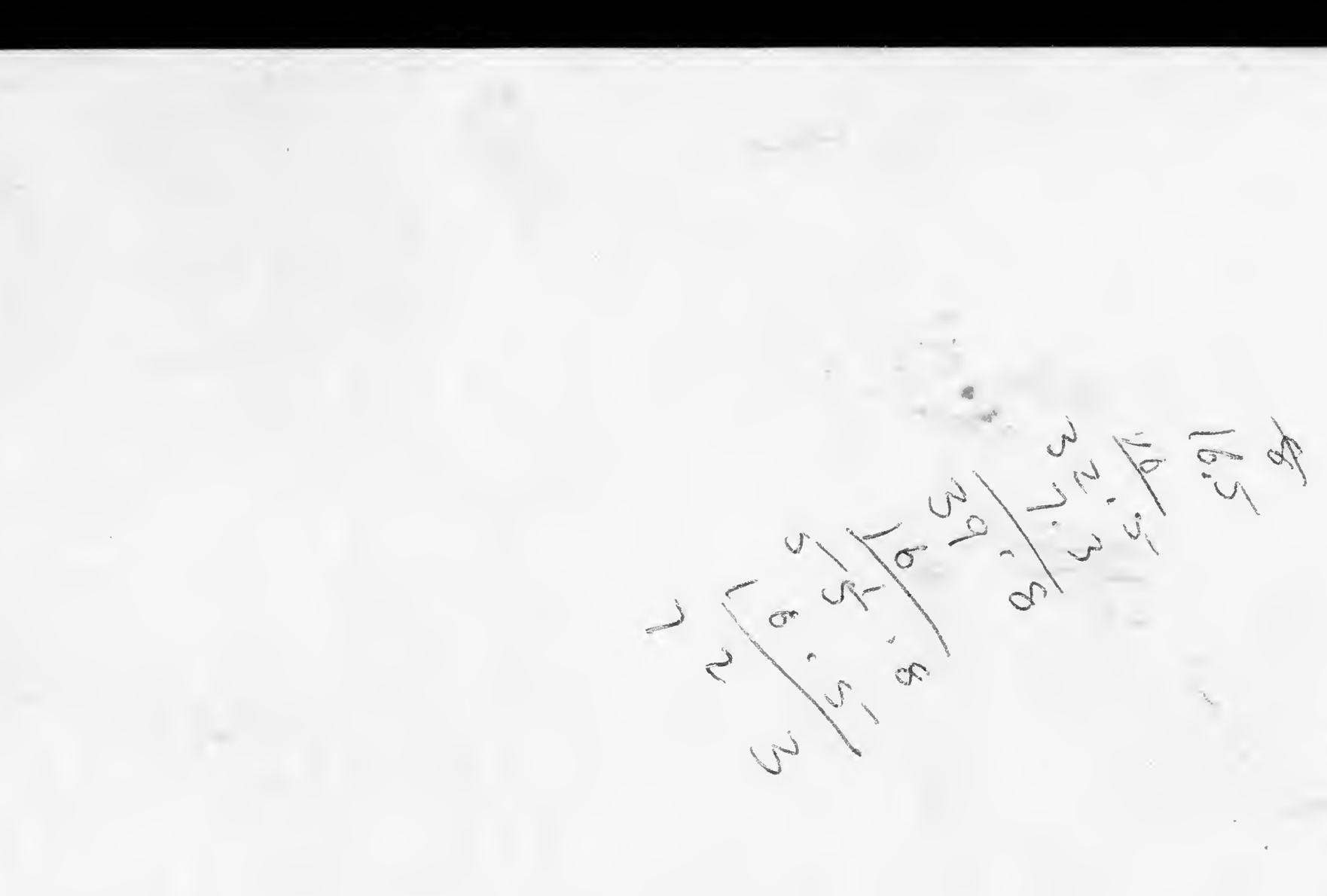
Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	06°03.2N	78°21.7W	235	8	—	—
0200	6°07N	78°21 W	220	10	—	—
0300	6°12N	78°24W	220	10	—	—
0400	06 23W	78 33W	220	15	—	—
0500	06 25	78 44W	220	15	220	1
0600	06 25	78 41	220	8	220	1
0700	STATION		020	7	220	1
0800	6°38'	78°56'	020	7	210	1
0900	6°44'	79°01'W	340	8	315	1
1000	6°55.6	79°13'W	340	8	315	2
1100	6°50'N	79°16'W	340	5	315	2
1200	6°50N	79°17W	320	15	320	2
1300	6°48N	79°16W	320	10	320	2
1400	6°45.9N	79°17W	320	8	340	2
1500	6°51N	79°21W	320	8	330	2
1600	07°01'	79 31	330	8	320	2
1700	07°05	79 37.5	265	11	350	2
1800	07°11	79 49	080	10	350	2
1900	07 14	79 55	080	10	350	2
2000	07°08'	80° 12.5'	240	15	345	2
2100	07°07'	80° 19'	240	15	240 345	2
2200	7°02.5'	80 32'	240	13	240 345	2
2300	6°59'	80°48'	240	18	280	2
Kor 2400	7°N	80°57'W	220	15	—	—

6°58'N

8.5

958b-SI-MNH
Rev. 9/28/66



Date 3AUG Ship ROCKAWAY (WSTT) Cruise No. Eastpac II

Organization USCG Recorder

Sunrise: Time 0617 Position: Lat. 06 21, Long. 80 41

Sunset: Time 1836 Position: Lat. 5° 08', Long. 80° 20

Miles travelled from 0000 hours to sunrise = 40

Miles travelled from sunrise to sunset = 80

Miles travelled from sunset to 2400 hours = 47

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	Electronic	6° 24.2'N	80° 39.3'W
2.	1200	Electronic	5° 41'N	80° 31.4'W
3.	2200	Celestial Electronic	4° 57'N	80° 16.8'W
4.	0000	Electrical	4° 43.0'N	80° 15.2'W
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	6° 55'N	80° 54.6W	220	12	—	—
0200	7° 01'N	80° 54.1W	220	10	—	—
0300	6° 58.1N	80° 53.2W	240	15	—	—
0400	06° 47.5'	80° 52.W	190	12	—	—
0500	06 39	80 49	240	16	—	—
0600	06 24N	80 43.5	180	12	—	—
0700	6° 24.2	80° 39.3	226	10	—	—
0800	6° 24.2'	80° 39.3	200	8	125	2
0900	6° 02.2'	80° 38'	200	8	125	2
1000	5° 59'	80° 35'	195	10	125	2
1100	5° 40'	80° 31'	195	10	185	2
1200	5° 41.0N	80° 31.4W	220	15	270	2
1300	5° 38.9N	80° 28.2W	220	14	230	2
1400	5° 38.9'N	80° 28.2W	250	15	260	2
1500	5° 40.8N	80° 26.5W	220	15	245	2
1600	5° 32'	80° 25'W	215	17	230	3
1700	5 20.5	80 19	215	17	230	3
1800	5° 08	80 20	207	19	220	3
1900	4° 56'	80 18	220	16	270	3
2000	4° 51'	80° 16.8	225	9	225	2
2100	4° 56'	80° 14'	225	9	225	2
2200	42 46	80. 16'	225	9	225	2
2300	4° 5'	80° 17'	225	8	225	2
2400	4° 43.0N	80° 15.2W	225	10	—	—

Date 4 AUG. 1967 Ship ROCKAWAY (WSTT) Cruise No. _____

Organization USCG Recorder _____

Sunrise: Time 0609 Position: Lat. 3°52' , Long. 79° 57'

Sunset: Time 1830 Position: Lat. 2° 17 , Long. 79 31

Miles travelled from 0000 hours to sunrise = 24

Miles travelled from sunrise to sunset = 105.5

Miles travelled from sunset to 2400 hours = 54.1

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0515	Omega	4°51'	79°53'
2.	0800	(1+2) CELESTIAL, ELECTRONIC	3°25.5'N	79° 44.0'W
3.	1200	CELESTIAL, ELECTRONIC	3° 09.0'N	79° 41.2'W
4.	2000	ELECTRONIC	2° 06.0'N	79° 20.8'W
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	4° 43 0N	80° 15.2W	225	10	—	—
0200	~~4° 30.0N~~ 4° 12N dec	~~80° 04.0W~~	225	15	—	—
0300	4° 08 N	80° 04 W	225	15	—	—
0400	4 04	80 00	218	14	-	-
0500	4 00	79 55	215	14		-
0600	3 52	79 57	218	15	190	2
0700	3 41	79 49	198	13	220	2
0800	3° 25.5'	79 44	225	10	220	2
0900	3° 17'	79° 48'	225	10	220	2
1000	3° 10.5'	79° 46'	225	10	220	2
1100	3° 18' N	79° 43'	225	10	220	2
1200	3° 09' N	79° 41.2'W	225	10	220	2
1300	3° N	79° 49'W	225	10	220	2
1400	2° 51'N	79° 36.2W	225	10	220	2
1500	2° 30 N	79° 34.5W	225	10	220	2
1600	2 25	79 33	220	9	220	2
1700	2 18	79 32	220	11	220	2
1800	2° 17.7	79 31	220	10	220	2
1900	2 06	79 27.6	220	14	220	2
2000	2° 06'	79 20.8'	235	10	240	2
2100	10.535'	79° 18'	~~270~~ 270	7	270	2
2200	10 49'	79° 24'	270	~~7~~ 7	270	2
2300	1° 41'	79 21.2	270	7	275	2
2400	1° 40'	79° 23.W	255	8	—	—

21.1

31.1

43.1

51.1

54.1

Date 5AUG67 Ship ROCKAWAY (W-377) Cruise No. _____

Organization USCG Recorder _____

Sunrise: Time 0623 Position: Lat. 1° 24'N Long. 80 31'W

Sunset: Time 1838 Position: Lat. 0° 31'N Long. 81°57'W

Miles travelled from 0000 hours to sunrise = 71

Miles travelled from sunrise to sunset = 124

Miles travelled from sunset to 2400 hours = 23

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	1558	CELESTIAL	1° N	82° W
2.	2000	ELECTRONIC	0°18.7'N	81°57.5'W
3.	0000	ELECTRONIC	0°22'N	81°55.0'W
4.	0300	CELESTIAL	1° 06.5N	81°27.0'W
5.	0800	CELESTIAL	1° 18.0'N	80°47.0'W

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	1°37.5N	79°27.3W	255	17	—	—
0200	1° 34'N	79°40'W	255	15	—	—
0300	1°31'N	79°59.2W	255	15	—	—
0400	1° 30N	80 04 W	2	17	-	-
0500	1 26	80 21 W	210	16	-	-
0600	1 25	80 26W	210	16		
0700	1° 21'	80 38 W	200	17	-	-
0800	1°18'	80°47'	200	20	210	2
0900	1°16.2'	80° 54.3	180	20	210	2
1000	1°13'N	81°07'W	210	10	210	2
1100	1° 13'	81°18.5	210	10	230	1
1200	1° 06.5N	81°27.0W	210	8	230	1
1300	1° 05'N	81°40W	210	10	230	1
1400	1°02'N	81°53W	210	10	230	1
1500	1°N	82°W	210	8	230	1
1600	1 N	82 W	210	8	230	1
1700	0 47	81 58	210	9	230	1
1800	0 37N	81 56	196	8.5	185	2
1900	0 26N	81°58W	196	8.5	196	2
2000	0° 18.7'N	81°57.5	195	4	195	1
2100	0° 21'N	81° 58'	195	2	195	1
2200	0° 21.2'N	81° 59'	200	2	210	1
2300	0° 19.5'	81° 56.5	200	2	210	1
2400	0°22'N	81°55.0W	240	2	—	—

10

Date 6 AUG. 67 Ship ROCKAWAY (WHEC-377) Cruise No. _____

Organization USCG Recorder _____

Sunrise: Time 0630 Position: Lat 0° 36' S, Long. 81° 55' W

Sunset: Time 1835 Position: Lat. 2° 4.5' S, Long. 82 00 W

Miles travelled from 0000 hours to sunrise = 36

Miles travelled from sunrise to sunset = 88

Miles travelled from sunset to 2400 hours = 30

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0608	☆	0° 34' S	82°00' W
2.	0800	☆	0° 52.5' S	82°00' W
3.	2000	☆	2° 19.7' S	81° 58.5' W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	0° 16' N	81° 55.6 W	240	8	—	—
0200	0° 06.1' N	81° 57.1 W	215	8	—	—
0300	0° 11.3 S	81° 59.0 W	215	10	—	—
0400	0° 22 S	82 00 W	220	12		—
0500	0° 32' S	82 00 W	220	15	220	1
0600	0 29.5	82 00	180	17	180	2
0700	0 42	81 58	205	8	180	2
0800	0° 52.5' S	82°00' W	200	8	200	1
0900	1° 03' S	82°00' W	200	4	210	2
1000	1° 05' S	81° 59' W	200	4	200	2
1100	1° 06.8' S	82 01.5' W	200	4	200	2
1200	1° 14.0' S	82° 01.0' W	200	10	200	1
1300	1° 30.4 S	81° 59' W	200	10	200	1
1400	1° 24.2' S	81° 57' W	200	10	200	1
1500	1° 20.5' S	81° 59.2' W	200	10	200	1
1600	1° 45'	81 59 W	200	6	200	2
1700	1° 48.5 S	81 59 W	200	10	200	3
1800	2° 01' S	82 W	180	15	180	3
1900	2° 6.5 S	82 W	169	10	180	3
2000	2° 19.7' S	81° 58.5	165	20	180	2
2100	2° 24' S	81° 56.5 W	165	17	180	2
2200	2° 27' S	81° 55' W	165	10	180	2
2300	2° 29.3 S	81° 56.5' W	165	8	180	2
2400	2° 33' S	81° 58' W	185	10	—	—

Date 7 AUG 67 Ship ROCKAWAY (WSO) Cruise No. _____

Organization USCG Recorder _____

Sunrise: Time 0629 Position: Lat. _____, Long. _____

Sunset: Time _____ Position: Lat. _____, Long. _____

Miles travelled from 0000 hours to sunrise = 71

Miles travelled from sunrise to sunset = _____

Miles travelled from sunset to 2400 hours = _____

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	VISUAL	2°-43.2'S	80°28.0'W
2.	1200	VISUAL	2°-27.8'S	80°03.5'W
3.				
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	2° 38'S	81° 51'W	180	12	—	—
0200	2° 36.5S	81° 31'W	180	12	—	—
0300	2° 31'S	81° 21.8W	180	12	—	—
0400	2° 32'S	81 09.5W	145	11	—	—
0500	2 35.5S	80 55.5W	145	12	-	-
0600	2 43	80 42	145	12	-	— —
0700	2 44	80 32	230	6	220	2
0800						
0900	PROCEEDING UP GUAYAS RIVER					
1000	TOWARDS GUAYAQUIL, ECUADOR					
1100						
1200						
1300						
1400						
1500						
1600						
1700						
1800						
1900						
2000						
2100						
2200						
2300						
2400						

2-53-2 (X) WITH
3-49-2 X WTD

Date 9 Aug Ship [illegible] (377) Cruise No. ____

Organization USCG Recorder ____

Sunrise: Time 0632 Position: Lat. —, Long. —

Sunset: Time 1834 Position: Lat. 03°16'W Long. 81°38.5'W

Miles travelled from 0000 hours to sunrise = —

Miles travelled from sunrise to sunset = —

Miles travelled from sunset to 2400 hours = 20

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	1200 Z	VIS & RAD	02-44.5S	80-27 W
2.	2000	DR, ELECTRONIC	03°05.0'S	81°58.0'W
3.				
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100						
0200						
0300						
0400						
0500						
0600						
0700						
0800						
0900			PROCEEDING	DOWN	RIVER	FROM
1000			GUAYAQUIL			
1100						
1200	2°44.5S	80 27 W	240	12	245	1/2
1300	2°46 S	80 35 W	235	11	245	1/2
1400	2°50S	80 48 W	235	11	245	1/2
1500	2 53S	81 05W	245	10	245	1/2
1600	2°56.8S	81° 17.1W	245	10	245	1/2
1700	3°S	81°31.1W	245	10	245	1/2
1800	3°2.7S	81°45.3W	245	13	245	1/2
1900	3°04'S	81° 57.2W	245	12	245	1/2
2000	3° 07.5S	82 01 W	135	0	—	—
2100	3° 07.5S	81 59 W	135	8	—	—
2200	3° 10.5S	81 59 W	135	8	—	—
2300	3 17 S	81 59 W	135	8	—	—
2400	3 19 S	81 59 W	135	7	—	—

Date 10 Aug 1967 Ship Rockaway (WSC) Cruise No. _____

Organization USCG Recorder _____

Sunrise: Time 0634 Position: Lat. 3°52'S Long. 82°00'W

Sunset: Time 1831 Position: Lat. 5° 36.5'S Long. 82° 03.5 W

Miles travelled from 0000 hours to sunrise = 36 mi

Miles travelled from sunrise to sunset = 96 m

Miles travelled from sunset to 2400 hours = 30 m

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	ELECTRONIC	4°14.8'S	82° 00.0W
2.	1200	CELESTIAL	4°32.3'S	82° 02.5W
3.	2000	ELECTRONIC	5° 52.0'S	82° 00.0W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	3° 30.2'S	82°00W	205	6	135	1/2
0200	3° 20'S	82 00	205	7	135	1/2
0300	3°16.2'S	82° W	195	7	—	—
0400	3°28.2'S	82° W	190	7	—	—
0500	3° 40'S	81° 58'W	185	12	—	—
0600	3° 52'S	82°W	195	12	150	1/2
0700	3 52	82	175	10	175	1/2
0800	4 14	82	175	10	175	1/2
0900	4 25	82	175	10	175	1/2
1000	4.34	82 02	130	4	130	1/2
1100	4 35	82 04	170	7	170	1
1200	4 40	82 04	135	13	140	1
1300	4 42.3	8202.5	140	10.5	140	1/2
1400	4 49	8207	150	10	140	1/2
1500	4 58	8208	150	10	140	1/2
1600	5° 22'S	82°00W	175	10	170	1/2
1700	5° 22'S	82°00W	180	13	160	1/2
1800	5° 30'S	82°04'W	155	13	160	1/2
1900	5° 43'S	82°03'W	170	5	160	1/2
2000	5° 52 S	82 00 W	175	12	130	1/2
2100	06 00	82 00	134	19	130	1
2200	06 00	82 01W	160	15	150	1/2
2300	06 01.5	82 01W	160	15	150	1/2
2400			135	20	180	1/2

Date 11 AUG Ship ROCKAWAY (W-37) Cruise No. Eastropac II

Organization USCG Recorder

Sunrise: Time ~~1827~~ 0637 Position: Lat. ~~8°30'S~~ 7°S, Long. 82°W

Sunset: Time 1827 Position: Lat. 8°30'S, Long. 82°W

Miles travelled from 0000 hours to sunrise = 47.7

Miles travelled from sunrise to sunset = 119

Miles travelled from sunset to 2400 hours = 7

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	DR, ELECTRONIC	07° 14.5'S	82° 01.0'W
2.	1200	CELESTIAL	07°34.0'S	81° 59.0'W
3.	2000	DR, ELECTRONIC	08° 50.8'S	82° 01.0'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	06-22S	082-00W	130	20	130	1
0200			125	18	130	1
0300			125	20	130	1/2
0400	06-47S	081-58W	135	10	130	1/2
0500	06-47S	081-58W	140	11	130	1/2
0600			150	13	130	1/2
0700	07-07S	081-58W	140	10	130	1/2
0800			127	11	130	1
0900	07-28S	081-57W	135	8	130	1
1000	07-28S	081-57W	135	8	130	2
1100	07-28S	081-57W	140	4	130	2
1200	07 ~~38~~ 28S	81-57W	140	3	130	2
1300	07 ~~44~~ 28S	82-01	140	5	140	2
1400	07 ~~53~~ 28S	82-02	160	15	140	2
1500	08 08S	82 00	155	15	140	2
1600	8°04'S	82-01W	170	10	170	2
1700	8°16'S	82° W	170	12	170	3
1800	8°31.5S	82° W	170	12	170	3
1900	8°46'S	82°W	160	15	160	3
2000	8 50.8	82 01.0	137	15	140	2
2100	8 50.8	82-01W	139	15	140	2
2200	8 50.8	82 01.0	139	15	140	2
2300	8 50.8	82-01.8	139	15	140	2
2400	850.8	8201 W	020	12	140	2

Date 12 AUG 1967 Ship ROCKBRIDGE (WAK 377) Cruise No. _____

Organization USCG Recorder _____

Sunrise: Time 0640 Position: Lat. ~~10°S~~ 9°49'S, Long. 82W

Sunset: Time 1823 Position: Lat. 9°52'S, Long. 81°59'W

Miles travelled from 0000 hours to sunrise = 48.5

Miles travelled from sunrise to sunset = 84

Miles travelled from sunset to 2400 hours = 6

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	DR, ELECTRONIC	10°01.5'S	81°59.0'W
2.	1200	CELESTIAL, ELECTRONIC	10°09.0'S	81°53.0'W
3.	2000	CELESTIAL	09°50.5'S	80°53.0'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	08°59'S	82°00'W	115	17	100	2
0200	09°08'S	82°00'W	130	20	100	2
0300	09°2'S	82°00'W	130	18	100	2
0400	09°33'S	82°09'W	150	15	150	2
0500	09°53'S	82°09'W	110	13	110	2
0600	9°39'S	82°00'W	135	15	130	2
0700	9°51'S	82°00'W	145	13	130	3
0800	10 01.5	81 59.2	135	17	140	2
0900	10 14	82	135	18	140	2
1000	10 14 S	82	135	20	140	3
1100	10 14	82	135	20	140	3
1200	10 09S	81-53W	120	20	140	3
1300	10 ~~30~~	81-12W	120	20	140	3
1400	100.5S	81-28W	130	19	140	3
1500	10025	81-20W	095	17	140	3
1600	10°02'S	81°22'W	135	15	130	3
1700	10°S	81°20'W	105	17	130	3
1800	9°54.5	81°00'W	105	20	130	4
1900	9°51'S	80°53'W	105	20	130	4
2000	9 51 S	80 53 W	105	20	130	4
2100	9 51 S	80 53 W	105	20	130	4
2200	9 51 S	80 53 W	015	20	130	4
2300	9 51 S	80 53 W	015	20	130	4
2400	9 50 S	80 53 W	140	18.5	130	3

Date 13 AUGUST 1967 Ship ROCKAWAY (WHEC 377) Cruise No. Eastropac II

Organization USCG Recorder

Sunrise: Time 0631 Position: Lat. 9°30'S, Long. 80°W

Sunset: Time 1813 Position: Lat. 10°31'S, Long. 78°53'W

Miles travelled from 0000 hours to sunrise = 50

Miles travelled from sunrise to sunset = 92

Miles travelled from sunset to 2400 hours = 42

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	ELEC.	09°26.0'S	79°56.8'W
2.	1200	CELESTIAL & ELECTRONIC	09°31.7'S	79°34.0'W
3.	2000	CELESTIAL & ELECTRONIC	10°41.8'S	78°48.3'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	9°49'S	80°-45'W	130	20	130	3
0200	9°44'S	80°-30'W	115	20	130	3
0300	9°42'S	80°-24'W	125	18.5	135	4
0400	9°37'S	80°13'W	135	10	135	4
0500	9°37'S	80°13'W	135	15	135	4
0600	9°36'S	80°07'W	105	10	135	4
0700	9°32'S	80°04'W	100	10	130	4
0800	9 26.5S	79 45 W	120	7.5	130	3
0900	9 24.5	79 33	120	7.5	130	4
1000	9 24.5	79 33	140	14	130	4
1100	9 22	79 39	130	15	130	4
1200	9-31.2S	79-34	140	17	130	4
1300	9-41.5	79-24	140	17	130	3
1400	9-42	79-28	140	18.5	130	3
1500	9-49S	79-15	140	18.5	135	3
1600	10°09'SS	79°08'W	140	20	160	4
1700	10°20.5'S	79°W	140	20	160	4
1800	10°28'S	78°55'W	135	20	160	4
1900	10°38.5S	78°49W	135	22	160	5
2000	10 41.8	78 48.3	135	23	160	5
2100	10 41.5	78 41	140	25	160	5
2200	10 5.1S	78 36	140	20	160	5
2300	11 08S	78 24	120	23	160	5
2400	11 13S	78 25W	124	22	160	4

1
1749
49
1838

Date 14 Aug 1967 Ship Ron Rawa (2037) Cruise No. ____

Organization LISCG Recorder ____

Sunrise: Time 0624 Position: Lat. 11°54'S, Long. 77°45'W

Sunset: Time 1808 Position: Lat. —, Long. —

Miles travelled from 0000 hours to sunrise = 78.9

Miles travelled from sunrise to sunset = —

Miles travelled from sunset to 2400 hours = —

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	ELEC., VISUAL	12° 01.5'S	77° 15.3'W
2.				
3.				
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	11-22 S	78.12 W	120	22	160	5
0200	11-29 S	78.12 W	134	23	160	4
0300	11-40 S	78-03 W	140	20	160	4
0400	11°36.5'S	78°09'W	130	20	160	4
0500	11° 48' S	77°58'W	135	20	160	4
0600	11°53'S	77° 35'W	130	18	160	4
0700	11°56'S	77° 31.8'W	130	14	160	4
0800			—			
0900			↓			
1000			CALLAO, PERU			
1100						
1200						
1300						
1400						
1500						
1600						
1700						
1800						
1900						
2000						
2100						
2200						
2300						
2400						

Date 16 Aug 1967 Ship Rockaway ( ) Cruise No. ____

Organization ____ Recorder ____

Sunrise: Time 0628 Position: Lat. Callao, Long. ____

Sunset: Time 1807 Position: Lat. 12°21'S, Long. 77°49' W

Miles travelled from 0000 hours to sunrise = Callao

Miles travelled from sunrise to sunset = 50.0

Miles travelled from sunset to 2400 hours = 31.0

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	2000	CELESTIAL	12° 31.0' S	78° 19.3' W
2.				
3.				
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100						
0200						
0300						
0400						
0500						
0600						
0700						
0800						
0900			CALLAO, PERU			
1000						
1100						
1200						
1300						
1400			160	17	208	½
1500			160	15	160	2
1600	12° 16.5'	77° 34.5' W	150	9	180	1½
1700	12° 15.0'	77° 40' W	150	10	180	1½
1800	12° 21'	77° 49' W	150	10	180	1½
1900	12° 20.1'	78° 04.5' W	135	14	185	½
2000	12° 31.0'	78° 19.3' W	160	10	160	½
2100	12° 30.85'	78° 43.1' W	160	14	160	½
2200	12° 30.85'	78° 03.1' W	155	14	160	½
2300	12° 30.85'	78° 03.1' W	165	14	160	½
2400	12° 30.85' S	78° 03.1' W	160	12	160	½

Date 17 AUG 67 Ship CGC ROCKAWAY (WAGO 378) Cruise No. ____

Organization USCG Recorder ____

Sunrise: Time 0628 Position: Lat. 12°50S. Long. 79°08

Sunset: Time 1816 Position: Lat. 13°21'S, Long. 80°29'W

Miles travelled from 0000 hours to sunrise = 37.8

Miles travelled from sunrise to sunset = 96.5

Miles travelled from sunset to 2400 hours = 50.4

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800		12°50'S	79°14.2'W
2.	1200		12°58.5'S	79° 31.8'W
3.	2000		13°27.2'S	80°48.5'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	12 26	78 14	160	10	160	2
0200	12 26	78 14	125	12	130	4
0300	12 33S	78 26W	175	12	130	4
0400	12° 39'S	78° 37'W	150	16	130	3
0500	12° 44.5'S	78° 52'W	150	16	160	3
0600	12°47'S	78° 53'W	150	10	165	3
0700	12°52'S	79° 02'W	150	10	185	3
0800	12°50.4'S	79° 14.2'W	210	10	200	2
0900	13° S	79° 31.3'W	160	3	200	2
1000	12°56'S	79° 31.3W	350	3	180	2
1100	12°56'S	79° 31.3W	350	3	190	2
1200	12 58.5S	79 31.8W	180	10	150	2
1300	13 03	79 43	180	10	180	2
1400	13°08'S	79 57.5	177	12	180	4
1500	13 12.1S	80 12'W	175	8	190	4
1600	13 13.1S	80 10 W	175	8	190	4
1700	13°11'S	80° 18' W	175	8	190	4
1800	13°19'S	80 25'W	175	8	125	3
1900	13°24.5S	80°37.8W	140	18	175	3
2000	13°27.2'S	80°48.5'W	175	10	155	½
2100	13°30'S	80°51'W	145	10	155	½
2200	13°30' S	80°51' W	145	15	155	½
2300	13° 39'S	80°53' W	145	15	155	½
2400	13°31'S	80 56'W	131	15	155	½

Date 18AUG67 Ship CGC ROCKAWAY (WAGO-377) Cruise No. ____

Organization USCG Recorder ____

Sunrise: Time 0641 Position: Lat. 13°52'S Long. 81°52'W

Sunset: Time 1827 Position: Lat. 14°29'S Long. 83°35'W

Miles travelled from 0000 hours to sunrise = 54.7

Miles travelled from sunrise to sunset = 98.2

Miles travelled from sunset to 2400 hours = 20

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800		13°57.5'S	82° 25.7'W
2.	1200		14° 04' S	82°43.0'W
3.	2000		14° 29.0'S	83°40.7'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	13°45.5S	81° 08' W	131	9.8	130	1/2
0200	13° 41'S	81° 22 W	138	11	130	1/2
0300	13 45S	81°31.5 W	145	15	130	1/2
0400	13°44.5S	81°32.2'W	135	10	130	1/2
0500	13°46.5S	81°37'W	095	11	135	1/2
0600	13°50'S	81°46.5'W	095	11	135	1/2
0700	13°53.5S	81°56.5'W	095	11	136	1/2
0800	13°57.5S	82°25.7W	160	10	155	1
0900	13°58'S	82°25.1W	160	10	155	1
1000	14°00'S	82°26'W	160	10	155	1
1100	14°S	82°28'W	160	10	155	1
1200	14 04 S	82 43 W	~~160~~ 135	11	140	2
1300	14 10S	82 46.5W	135	12	130	1
1400	14 15	82 57W	140	15	140	2
1500	14 19S	83 2.5W	130	15	130	2
1600	14 18S	83 02W	130	15	130	1
1700	14 22.8S	83 12.5W	140	15	130	1
1800	14°26.5S	83°29'W	140	15	130	1/2
1900	14°31.2S	83°40.8'W	~~140~~ 135	15	130	1/2
2000	14°27.0S	83°40.7W	120	15	135	1
2100	14°27.0S	83° 40.7W	110	16	135	1
2200	14° 27.0S	83° 40.7 W	120	18	135	1
2300	14° 27.0S	83° 40.7 W	135	20	135	1
2400	14° 27.0 S	83° 40.7 W	135	15	135	1

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Date 19 Aug 67 Ship CGC ROCKAWAY (WAGO-377) Cruise No. ____

Organization USCG Recorder ____

Sunrise: Time 0553 Position: Lat. 14° 41.5 S Long. 84° 50' W

Sunset: Time 1734 Position: Lat. 13° 49.3 S Long. 85° 01' W

36
24
84
94

Miles travelled from 0000 hours to sunrise = 53

Miles travelled from sunrise to sunset = 95

Miles travelled from sunset to 2400 hours = 42

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	CELESTIAL	14°58.5'S	85°00.0'W
2.	1200	CELESTIAL	14°42.7'S	85°00.5'W
3.	2000	CELESTIAL	13°35.0'S	85°00.0'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	14 33S	83 52	130	14	130	1
0200	14 38S	84 03	130	14	130	1
0300	14 44S	84 15	130	17	130	2
0400	14 41S	84° 21'W	130	15	130	½
0500	14° 47S	84° 24 W	130	15	130	½
0600	14° 51'S	84° 42W	130	15	130	½
0700	14° 54.5S	84° 50.8'W	115	15	136	½
0800	14°58.5'S	85°W	130	10	135	1
0900	14°58.5'S	85°W	130	10	135	1
1000	14°58.5'S	85°W	120	12	130	1
1100	14 54	85 W	110	12	130	1
1200	1445	85 W	090	8	140	3
1300	1430S	85 W	090	8	140	3
1400	14 18	85 W	090	8	140	3
1500	14 13	85 W	104	8	140	3
1600	14° 10'	85 00W	134	14	150	3
1700	13°58.5S	85 00W	115	8	150	3
1800	13°41.8S	85 06W	115	8	150	3
1900	13° 35'S	85°02.7W	120	15	150	3
2000	13°35.0S	85 W	130	15	150	2
2100	13°35'S	85W	130	17	150	2
2200	13° 30'S	85W	120	15	150	1
2300	13°20.5'S	85W	110	10	150	1
2400	13° 10.0'S	85W	105	15	150	2

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Date 20 Aug 1967 Ship USCGC ROCKAWAY (WHEC-378) Cruise No. _____

Organization USCG Recorder _____

Sunrise: Time 0553 Position: Lat. 12°42'S, Long. 85°04'W

Sunset: Time 1734 Position: Lat. 11°09'S, Long. 85°W

Miles travelled from 0000 hours to sunrise = 40

Miles travelled from sunrise to sunset = 90

Miles travelled from sunset to 2400 hours = 53

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800		14°58.5'S	85°00'W
2.	1200		14°42.7S	85° W
3.	2000		13° 35'S	85° W
4.				
5.				

Wrong Aug 19

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	12 53	85	103	12	100	1
0200	12 53	85	120	15	130	1
0300	12 53	85	140	15	130	1
0400	12 53	85	160	15	135	1
0500	12 53	85	160	15	135	1
0600	~~12 53~~ 12° 44'	~~85°04'~~	160	15	135	1
0700	12° 28.5	85°05.5	160	15	135	1
0800	12°17.2'S	85°01.0'W	110°	10	145	2
0900	12°13'S	85°W	125	10	145	1
1000	12°13'S	85°W	120	10	150	1
1100	12°13'S	85°W	120	10	150	1
1200	12 00.3S	85 W	090	12	150	3
1300	11 51 S	85 W	090	10	150	3
1400	11 37.5S	85 W	090	12	150	3
1500	11 29	85 W	090	12	150	3
1600	11 29	85 W	130	15	150	3
1700	11° 15 S	85°W	130	9	150	3
1800	11° 03.2	85°W	135	16	150	3
1900	10°52'S	85° W	150	12	150	3
2000	10°46'S	85°W	135	15	130	1
2100	10° 46'S	85° W	130	15	130	1
2200	10° 46'S	85° W	130	18	130	1
2300	10° 46'S	85° W	130	18	130	1
2400	10 44	85	130	15	130	2

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Date 21 Aug 67 Ship ROCKAWAY (WAGO) 377 Cruise No. ____

Organization USCG Recorder ____

Sunrise: Time 0549 Position: Lat. 10°00'S, Long. 85°00W

Sunset: Time 1740 Position: Lat. 8°20'S, Long. 85°02'W

Miles travelled from 0000 hours to sunrise = 40.3

Miles travelled from sunrise to sunset = 97.0

Miles travelled from sunset to 2400 hours = 42

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800		9°31.8'S	85°03.6'W
2.	1200		9°03.0'S	85°07.8'W
3.	2000		7°59.0'S	85°02.0'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	10 39.5S	85 00W	135	15	130	2
0200	10 27	85 00W	130	15	130	2
0300	10 15	85 00	130	15	130	2
0400	10°05'S	85°00'W	125	14	130	2
0500	10°05'S	84°58.3'W	122	12	130	2
0600	9°55'S	85°00'W	125	10	135	2
0700	9°42.5S	85°00'W	125	10	135	2
0800	9°31.8'S	85°03.6'W	120	10	135	2
0900	9°23'S	85°W	120	10	135	2
1000	9°23'S	85°W	120	10	135	2
1100	9°23'S	85°W	120	10	135	2
1200	9°03'	85 07.8	135	15	135	2
1300	8 51	85 03	135	15	135	2
1400	8 37.3S	85 01.8W	"	"	"	"
1500	8°35'S	85° 00.6W	"	"	"	"
1600	8°32'S	85°01.5W	135	15	135	2
1700	8°24.5S	85°01.5W	135	16	135	3
1800	8°16'S	85°02'W	135	16	135	3
1900	8°07'S	85°02'W	135	16	135	3
2000	7°59'S	85°02'W	135	20 15	135	2
2100	7°59'S	85°02W	135	18	135	2
2200	7°59'S	85°02'W	140	18	135	2
2300	7°53'S	85W	130	15	140	1
2400	7 42	85 W	125	16	130	1

Date 22 AUG '67 Ship ROCKAWAY ( ) Cruise No.

Organization USCG Recorder

Sunrise: Time 0547 Position: Lat. 6°58'S, Long. 85°W

Sunset: Time 1749 Position: Lat. 5°25'S, Long. 85°W

Miles travelled from 0000 hours to sunrise = 38.6

Miles travelled from sunrise to sunset = 86.2

Miles travelled from sunset to 2400 hours = 25.4

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800		6°40'S	85°07'W
2.	1200		6°17.3'S	85°05'W
3.	2000		5°11.3'S	84°58.5'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	7°30'	85 W	110	10	150	2
0200	7 19	85	100	10	150	2
0300	7 17	85	135	10	150	2
0400	7°12'S	85 W	135	10	150	2
0500	7°03'S	25 W	135	12	150	2
0600	7°54'S	25 W	150	11	145	2
0700	6°46	85 W	150	11	145	2
0800	6°40'S	85°07'W	140	10	150	2
0900	6°35'S	85W	140	11	150	2
1000	6°33S	85°09W	140	10	150	2
1100	6°28S	85°08W	140	10	145	2
1200	6°17.3S	85 05 W	130	6.5	150	2
1300	6 05S	85 02 W	130	7	150	3
1400	5°52	85 02	140	11	150	3
1500	5°52	85 02	140	10	150	3
1600	5°43'S (5 43'S)	85°00'W	130	10	155	2
1700	5°32'S	85°00'W	130	12	155	2
1800	5°19'S	85°00'W	180	11	140	2
1900	5°14'S	85°00'W	180	11	140	2
2000	5°11.3'S	84°58.5W	160	10	—	—
2100	5°11.3'S	84°58.5W	165	10	—	—
2200	5°11.3'S	84°58.5'W	160	10	—	—
2300	5°11.3'S	84°58.5'W	160	10	—	—
2400	50 05	85 00 W	140	8	160	3

Date 23 Aug 1967 Ship ROCKAWAY (____) Cruise No. ____

Organization USCG Recorder ____

Sunrise: Time 0542 Position: Lat. 4°14'S, Long. 85°W

Sunset: Time 1744 Position: Lat. 2° 53'S Long. 85°W

Miles travelled from 0000 hours to sunrise = 49.3

Miles travelled from sunrise to sunset = 81.0

Miles travelled from sunset to 2400 hours = 52.1

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0900		3°51.8'S	85° 05.0'W
2.	1200		3° 42.5'S	85° 00.5'W
3.	2000		2° 27.5'S	84° 58.5'W
4.				
5.				

5 05
85

Hourly Positions:

12.4

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.	
0100	04 53.5S	85 00W	140	10	160	2	
0200	04 45	85 00	130	9	170	2	
0300	04 33S	85 00	130	10	170	2	
0400	4° 26'S	85°	130	10	155	3	
0500	4° 22'S	85°	125	10	155	3	
0600	4° 11'S	85°	102	9	160	2	
0700	4° 04.5S	85°	150	9	145	1	
0800	3° 57'S	85° 05'	160	10	180	1	
0900	3° 38'S	85° 05'	160	10	180	1	
1000	3° 38.8'S	85° 05'	170	10	180	2	
1100	3° 40.5'S	85° 05'	170	10	180	2	
1200	3° 42.5S	85 00.5'W	160	7	170	2	swells
1300	3 30.5	85 00 W	155	7	170	2	"
1400	3 18 S	85 00 W	140	4	170	2	"
1500	3 08.5S	85 00 W	140	4	170	2	"
1600	3° 01.5'S	85° 00'W	160	2	170°	2	
1700	3° 01'S	85° 00'W	160	8	170	2	
1800	2° 49'S	85° 00'W	185	11	175	2	
1900	2° 39'S	85° 00'W	185	10	175	2	
2000	2° 27.5'S	84° 58.5'W	180	10	180	1	
2100	2° 16'S	85°W	175	10	175	1	
2200	2° 16'S	85°W	160	12	175	1	
2300	2° 16'S	85°W	160	11	175	2	
2400	2 10	85	160	7	170	2	

3'51'

Date 24 Aug 67 Ship ROCKAWAY( ) Cruise No.

Organization USCG Recorder

Sunrise: Time 0540 Position: Lat. 1° 22'S, Long. 85° W

Sunset: Time 1946 Position: Lat. 0° 18' N, Long. 85° W

Miles travelled from 0000 hours to sunrise = 40

Miles travelled from sunrise to sunset = 98.6

Miles travelled from sunset to 2400 hours = 24

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0900	⊙ + DR	0° 56.5' S	85° 01.5' W
2.	1200	⊙ + LAN	0° 31.8' S	85° 03.7'
3.	~~2000~~	2	0° 44.5' N	84° 55.5' W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	2° 01'S	85° 00'W	165	7	170	2
0200	1 45.5	85 00W	165	7	170	2
0300	1 35	85	165	9	170	2
0400	1° 31'S	85 00W	~~170~~	~~2~~ 10	170	2
0500	1° 30'S	85 00W	~~180~~ 175	10	180	2
0600	1° 19'S	85° 00'W	~~180~~ 175	10	180	2
0700	1° 07'S	85° 00'W	180	15	180	2
0800	0° 52'S	85° W	180	10	180	2
0900	0° 40'S	85.05° W	180	10	180	2
1000	0° 40'S	85.05° W	180	10	180	2
1100	0° 33.5'S	85.03'W	180	8	180	2
1200	0° 31.8'S	85° 03.7	210	14	210	1
1300	0° 20	85 00	180	14	210	2
1400	0 12.5	85 00	180	14	210	2
1500	0	85	180	14	200	2
1600	0	85°	180	14	200	2
1700	0° 09'N	85° W	180	14	200	2
1800	0° 19'N	85° W	180	15	200	2
1900	0 28.5N	85° W	180	15	200	2
2000	0° 44.5'N	84° 55.5W	180	14	190	2
2100	0° 44.5'N	84° 55.5W	180	15	190	2
2200	0° 44.5'N	84° 55.5W	180	10	190	2
2300	0° 44.5'N	84° 55.5W	180	16	190	2
2400	0° 47 N	84 55 W	197	15	190	2

$\frac{5}{6}$ 12.5 $\frac{62.5}{6}$ 10.4

$\frac{10}{6} \times 8.7$

1.4

10.4

11.8

Date 25AUG67 Ship Rockaway (WAGO-377) Cruise No. ____

Organization USCG Recorder ____

Sunrise: Time 0538 Position: Lat. 1°24'N, Long. 85°03.5'W

Sunset: Time 1748 Position: Lat. 2°55'N, Long. 85°00.0W

Miles travelled from 0000 hours to sunrise = 38.9

Miles travelled from sunrise to sunset = 82.1

Miles travelled from sunset to 2400 hours = 36

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	CELESTIAL	1°57.0'N	84°56.3'W
2.	1200	CELESTIAL	3°16.8'N	84°56.8'W
3.	2000	CELESTIAL	3°15.0'N	84°58.8'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	0° 51 N	84 55.5	213	14.5	210	2
0200	0 57N	85 00	210	15	210	2
0300	1 04 N	85 00	210	15	210	2
0400	1 15'N	85 00W	200	15	220	2
0500	1° 23N	85 03'W	200	15	210	2
0600	1° 24.8'N	85°04'W	200	15	210	2
0700	1° 35'N	85° 00'W	195	15	210	2
0800	1°57.0'N	84°56.3'W	220	17	200	2
0900	2°01.N	84°56 W	210	15	210	2
1000	2° 01.N	84°56'W	200	16	200	2
1100	2° 02.5'N	84°57'W	200	16	200	1
1200	2° 15.0 N	85 00 W	220	16	220	2
1300	2 28.0 N	84 57 W	220	16	220	2
1400	2 34 N	84 58W	220	15	220	2
1500	2 43.5N	84 59.5	220	15	220	2
1600	2° 47° N	85°00 W	200	15	220	2
1700	2° 49 N	85°00W	200	15	195	2
1800	2° 57'N	85°00'W	200	15	195	2
1900	3°08'N	85°00'W	180	16	210	2
2000	3°15'N	84°58.8'W	185	16	180	2
2100	3°27.5'N	85°W	185	15	180	2
2200	3°27.5'N	85°W	210	16	180	2
2300	3°27.5'N	85°W	210	13	180	2
2400	3 32 N	85 W	210	14	210	2

Date 16 AUG 67 Ship ROCKAWAY (____) Cruise No. ____

Organization USCG Recorder ____

Sunrise: Time 0535 Position: Lat. 4 15N Long. 85 00W

Sunset: Time 1750 Position: Lat. 6° 03'N Long. 85 00W

Miles travelled from 0000 hours to sunrise = 33

Miles travelled from sunrise to sunset = 88

Miles travelled from sunset to 2400 hours = ~~[illegible]~~ 38

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	1200	D LAN	5° 15N	84° 46' W
2.	2000	ELECTRONIC OR CELESTIAL	6° 19.7N	84° 55.5W
3.	0000	ELECTRONIC	4° 41.0'	84° 30 W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	30 46N	84 57.5W	215	15	220	2
0200	2 50N	85 W	220	15	220	2
0300	2 07 N	85 W	220	15	220	2
0400	4 07 N	85 W	210	17	220	2
0500	4 07 N	85 W	210	16	220	2
0600	4 18 N	85 W	210	17	220	3
0700	4 28 N	85 W	210	17	220	3
0800	4°52'N	85 W	~~215~~ 195	~~15~~ 15	230	2
0900	4°48'N	85 W	210	10	230	2
1000	4°48'N	85° W	210	15	230	2
1100	5°00'N	85° W	210	15	230	2
1200	5 15N	84 46W	210	15	220	3
1300	5° 25.5N	84 52	285	17	220	4
1400	5 36.5N	84 57	263	17	225	3
1500	5 41.5N	85 W	254	15	230	3
1600	5 42N	85W	260	20	275	3
1700	5 54 N	85 W	260	20	270	3
1800	6 05 N	85 W	250	15	270	3
1900	6 [illegible]	85 W	245	17	270	3
2000	6 [illegible] N	84°55.5'W	240	6	—	—
2100	6°19.7'N	84°55.5W	220	10	—	—
2200	6°19.7'N	84°55.5'W	220	6	—	—
2300	6°24N	84° 56' W	210	6	—	—
2400	6 32	84 56	290	16	—	

6°19.7'N

3:2

Date 27Aug67 Ship ROCKAWAY (____) Cruise No. ____

Organization USCG Recorder ____

Sunrise: Time 0531 Position: Lat. 07°09'N, Long. 84°44'W

Sunset: Time 1750 Position: Lat. 08°30'N, Long. 85°03'W

Miles travelled from 0000 hours to sunrise = 78 mi

Miles travelled from sunrise to sunset = 63 mi

Miles travelled from sunset to 2400 hours = 41 mi

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	Q+DR	07°39'N	85°00.5'W
2.	1200	LAN ☉	07°52.0'N	85°04'W
3.	2000	CELESTIAL	08°53.0'N	85°00.5'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	6 42 N	84 57 W	250	6	250	3
0200	6 51 N	84 57 W	265	8	250	3
0300	6 58 N	84 57 W	250	8	250	3
0400	"	"	250	7	250	2
0500	7 04 N	84 00 W	250	7	250	2
0600	7 10 N	84 44 W	250	8	250	2
0700	7 19 N	84 50 W	250	8	250	2
0800	7°28'N	84 00 W	210	6	240	1
0900	7° 36.5'N	84 [illegible] W	250	6	240	1
1000	7° 35.5'N	8[illegible] W	260	5	220	1
1100	7° 36.N	85° W	260	9	230	1
1200	7 52	85 04	250	5	230	2
1300	8 02 N	85 04 W	280	5	230	2
1400	8 07	85 2.5 W	280	7	230	2
1500	8 14.6 N	85 01.0 W	290	6	230	2
8°19'N 1600	8 20 N	85 00 W	140	5	230	1
1700	8° 27'N	85 00 W	140	3	230	1
1800	8°30 N	85 04 W	140	8	230	1
1900	8° 47'N	85 08 W	270	5	230	1
2000	8° 53.9 N	85 00.5 W	300	4	—	—
2100	8° 53.9 N	85 00.5 W	240	3	—	—
2200	8° 53.9 N	85 00.5 W	195	6	—	—
2300	8° 58.4 N	84 58.5 W	210	6	—	—
2400	9 08	84 57	250	3	—	—

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Date 28 Aug. 67 Ship ROCKAWAY( ) Cruise No. ____

Organization USCG Recorder ____

Sunrise: Time 0532 Position: Lat. ____, Long. ____

Sunset: Time 1748 Position: Lat. MOORED - PUNTARENAS, COSTA RICA Long.

Miles travelled from 0000 hours to sunrise = 57

Miles travelled from sunrise to sunset = 19

Miles travelled from sunset to 2400 hours = —

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800		09° 47.0 N	84° 47.9 W
2.				
3.				
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	9 14 N	84 54.5 W	335	3	—	—
0200	9 26.5 N	84 50.5	350	4	—	—
0300	9 26.5 N	84 50.5	340	4	—	—
0400			355	7	—	—
0500			350	4	010	1/2
0600			285	10	010	1/2
0700			335	7	010	1/2
0800						
0900						
1000						
1100	PUNTARENAS, COSTA RICA					
1200						
1300						
1400						
1500						
1600						
1700						
1800						
1900						
2000						
2100						
2200						
2300						
2400						

Date 30 ~~JULY~~ AUGUST 67 Ship ROCKAWAY (W-377) Cruise No. Eastpac II

Organization USCG Recorder QMOW's

Sunrise: Time 0535 Position: Lat. PUNTA ~~ARENAS~~ Long.

Sunset: Time 1747 Position: Lat. 10°03'N Long. 85°58'W

Miles travelled from 0000 hours to sunrise = ~~1~~ 2

Miles travelled from sunrise to sunset = V.

Miles travelled from sunset to 2400 hours = 78.2

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	1200	ELECTRONIC/VISUAL	9° 47.9'N	84° 49.9'W
2.	2000	RADAR	10° 23.5'N	86° 17.5'W
3.				
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100						
0200						
0300						
0400						
0500						
0600						
0700						
0800						
0900						
1000						
1100						
1200	9°47.4'N	84° 49.8'W	130	4	175	1
1300	9° 36'N	85° 58.8'W	~~135~~ 145	~~5~~ 7	175-~~225~~	1
1400	9° 34'N	85° 19.8'W	~~185~~ 200	~~5~~ 7	175 ~~225~~	1
1500	9°41'N	85° 24.8'W	~~210~~ 195	8	225	1
1600	9°51	85° 44	195	7	220	1
1700	9°59'N	85° 52'W	195	7	210	1
1800	10 05'N	85 59'W	330	16	330	5
1900	10 12N	86 05W	030	14	050	3
2000	10 23.5	86 17W	040	14	030	3
2100	10 31.5	86 25W	025	21	020	3
2200	10 41.5	86 33	030	20	030	3
2300	10 50	86 44	025	20	030	3
2400	11 N	86 54	020	15	—	—

PUNTARENAS, COSTA RICA

10 27

86 20.5

Date 31AUG67 Ship ROCKAWAY (WHEC-377) Cruise No. EASTROPAC II

Organization USCG Recorder

Sunrise: Time 0540 Position: Lat. 11-52N Long. 87-47W

Sunset: Time 1803 Position: Lat. 11-08N Long. 88-00W

Miles travelled from 0000 hours to sunrise = 40 mi.

Miles travelled from sunrise to sunset = 83 mi.

Miles travelled from sunset to 2400 hours = 3.6 miles

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0500	Celest.	12 04.5	87 59.7
2.	1200	"	11°56.0'N	88°02.6'W
3.	2000	" + D.R.	10 44.5N	87 58.5W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	11°09'N	87°04'W	025	15	040	1
0200	11°13.2'N	87°10.3'W	010	18	030	1
0300	11°23.8'N	87°25'W	035	17	030	1
0400	11 32 N	87.35W	035	17	030	1
0500	11 43 N	87 43 W	035	19	030	1
0600	11 47N	87 53 W	035	12	030	1
0700	11 59 N	87 56 W	035	12	030	1
0800	12 04.5	87 59.7	035	21	030	2
0900	12 01.8	87 59.5	060	20	050	2
1000	11 53.5	87 59.5	060	15	080	2
1100	11 55.5	88 02	065	12	030	2
1200	11°56'N	88°02'W	130	10	015	2
1300	11°47.5'N	88° 03'W	130	10	020	2
1400	11°40'N	88°02'W	130	10	020	2
1500	11° 27'N	88 01'W	130	10	020	2
1600	11 21 N	88 00 W	130	09	020	3
1700	11 14 N	88 01 W	130	11	020	3
1800	11 09 N	88 00 W	135	14	020	3
1900	11 00 N	88 00 W	115	20	020	3
2000	10 44.5	87 58.5 N	090	10	100	2
2100	10 44.5	87 58.5	090	10	100	2
2200	10 45.5	87 58.5	090	10	100	2
2300	10 45.5	87 58.5	100	10	100	2
2400	"	"	100	10	100	1½

Date 15 SEPT 67 Ship ROCKAWAY ( ) Cruise No. ____

Organization USCG Recorder ____

Sunrise: Time 0543 Position: Lat. ____, Long. ____

Sunset: Time 1759 Position: Lat. ____, Long. ____

Miles travelled from 0000 hours to sunrise = 35

Miles travelled from sunrise to sunset = 29

Miles travelled from sunset to 2400 hours = 57.1

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0500	Celestial	10°04'N	88 23.5
2.	1200	CELESTIAL	09°45.1'N	88° 13.0'W
3.	2000	CELESTIAL	08°33.2'N	88° 03.0'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	10° 48'N	88-11.5W	090	13	—	—
0200	10° 39'N	88° 13.1W	090	16	—	—
0300	10° 31'N	88° 07.5W	030	14	—	—
0400	10-21N	88 -18W	035	10	—	—
0500	10-21N	88 -18W	035	15	—	—
0600	10-21N	88 -18W	035	10	—	—
0700	10° 11'N	88°-16.7W	065	11	010	2
0800	10 04N	88 23.5	045	7	190	2
0900	09 33	88 17.5	045	10	190	2
1000	9 47.5	88 13	145	7	190	2
1100	9 41.5	88 13	140	7	190	2
1200	9°45.1'N	88°12'W	130	6	190	1
1300	9° 38'N	88 06W	130	6	190	1
1400	9°33.2N	88°03.0'W	100	7	190	1
1500	9°13.5N	88°01.'W	120	7	190	1
1600	9-01N	88000W	CALM	12	190	1
1700	"	"	190	6	195	1
1800	8-58.2	88 04W	145	4	195	3
1900	8-45.5	88 04W	CALM	12	195	3
2000	8 34N	88 03	169	6	190	2
2100	8 21.5	88 01.5	169	5	190	2
2200	8 13N	88 01	169	3	190	2
2300	8 13N	88 01	210	4	190	2
2400	8°11.6'N	88°W	215	8	—	—

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Date 2 SEPT 67 Ship R.C. Rowley (WAT) Cruise No Eastpac 2

Organization USCG Recorder

Sunrise: Time 0545 Position: Lat. 7-19N Long. 88W

Sunset: Time 1759 Position: Lat. 6°55N Long. 88W

Miles travelled from 0000 hours to sunrise = 41

Miles travelled from sunrise to sunset = 97

Miles travelled from sunset to 2400 hours = 33.8

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	Celestial	6°56N	87 40.8
2.	1200	"	6°47.2'N	87°57.0'N
3.	2000	"	5 26	88 07
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	[illegible]	[illegible]	240	8	—	—
0200	7 7 N	88 W	235	11	—	—
0300	7°14.5 N	88 W	230	10	—	—
0400	733 N	88 W	250	11	195	2
0500	"	"	250	7	195	2
0600	7 19 N	"	250	9	195	2
0700	7 12 N	"	250	10	190	2
0800	7 00	87 42	250	8	180	2
0900	6 49	87 47	250	8	200	2
1000	6 42	87 58	250	10	202	3
1100	6 42	87 58	250	10	202	3
1200	6°47.2'N	87°57.0'N	220	10	200	2
1300	6°42'N	88° W	220	8	200	2
1400	6°28.3'N	88° W	210	13	200	2
1500	6°14.5'N	88° W	220	11	200	2
1600	[illegible]	[illegible]	250	7	200	2
1700	6°00 N	88 W	270	6	200	2
1800	6°55 N	"	270	9	200	2
1900	6 43 N	88 W	265	10	200	2
2000	5 26	88 07	270	13	195	2
2100	5 17	88 07	270	14	220	2
2200	5 15	88	210	15	220	2
2300	5 15	88	210	15	220	2
2400	"	"	220	10	220	2

Date 3 SEPT 67 Ship Rockaway (WHEC-37) Cruise No. Eastpac II

Organization USCG Recorder The Asst

Sunrise: Time 0545 Position: Lat. _____, Long. _____

Sunset: Time 1757 Position: Lat. _____, Long. _____

Miles travelled from 0000 hours to sunrise = 54

Miles travelled from sunrise to sunset = —

Miles travelled from sunset to 2400 hours = 59.5

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	2000	Radar	05°04'N	87° 25'
2.				
3.				
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	5°18'N	87°59'W	240	15	210	2
0200	5°21.5'N	87°45'W	130	8	210	2
0300	5°25'N	87°36.7'W	220	12	240	3
0400	5°31'N	87.21.2W	200	12	240	2
0500	5°35.2N	87.11.9W	200	11	240	3
0600	—	—	200	10	240	1
0700		—	255	2	—	—
0800		—	260	2	—	—
0900						
1000						
1100						
1200						
1300						
1400						
1500						
1600			200	6	—	—
1700			180	10	180	2
1800			155	15	180	2
1900			150	13	180	2
2000	5 04	87 25	150	14	180	2
2100	4 56 N	87 35	150	14	180	2
2200	4 46	87 46	150	16	150	2
2300	4 36	87 56	150	16	150	2
2400	11	11	145	13	150	2

226
15

Date 4 SEPT 1967 Ship Rockaway (WHEC 377) Cruise No Eastpac II

Organization USCG Recorder

Sunrise: Time 0547 Position: Lat. 03-54 N Long. 88 W

Sunset: Time 1753 Position: Lat. 02°-21.8'N Long. 88 W

Miles travelled from 0000 hours to sunrise = 37 mi.

Miles travelled from sunrise to sunset = 73

Miles travelled from sunset to 2400 hours = 52.5

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	⊙ + D.R.	3°26-2 N	88° 02.3' W
2.	1200	LAN + ⊙'s	3° 15.0'N	88° 04.3' W
3.	2000	omega	2° 04 N	88° 02' W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	4°39'N	87°57'W	170	17	190	1
0200	4°29.5'N	87°56.5'W	190	15	190	1
0300	4°12'N	87°57'W	190	15	190	1
0400	4-02 N	88 W	"	"	"	"
0500	3-54 N	88 W	"	"	"	"
0600	3-49 N	88 W	"	"	"	"
0700	3-36 N	88 W	"	10	"	2
0800	3 26.2	88 02.3	180	15	180	3.
0900	3 22	88 04	180	15	180	3
1000	3 22	88°04'W	180	15	180	3
1100	3 22	88°04'W	180	15	180	3
1200	3° 15'N	88-04'W	175	18	180	3
1300	3°02.5	88° 03'W	175	20	180	3
1400	2°51.5'N	88°02'W	175	15	180	3
1500	2°40.1'N	88°W	175	15	180	2
1600	2-40 N	88 W	175	15	180	2
1700	2 35.0N	88-01W	165	15	180	2
1800	2 23 N	88 00 W	165	15	180	2
1900	2 08 N	88 00 W	175	15	180	2
2000	2 04	88 02	185	7	180	2
2100	2 04	88 02	185	10	180	1
2200	2 04	88 02	150	8	150	1
2300	2 03	88 02	150	8	150	1
2400	1°46'N	88°W	155	10	152	2

Date 5 SEPT 67 Ship Rockaway (WAGB-37) Cruise No. Eastpac II

Organization USCG Recorder

Sunrise: Time 0547 Position: Lat. 0°37'N Long. 88°06'W

Sunset: Time 1754 Position: Lat. 0°20'S Long. 88°00'W

Miles travelled from 0000 hours to sunrise = 43

Miles travelled from sunrise to sunset = 79

Miles travelled from sunset to 2400 hours = 37.9

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	CELESTIAL	0°37.5'N	88°02.0'W
2.	1200	CELAN	[illegible] 0°22.4'N	88°02.4'W
3.				
4.	2000	omega	0°46'S	88°06'W.
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	1°36'N	88°W	150	10	150	2
0200	1°25'N	88°W	145	10	150	2
0300	1°14'N	88°W	150	10	150	2
0400	1-14.5N	88 W	150	15	150	2
0500	1-13.8N	88 04.5W	150	15	150	2
0600	0-52.1	88 06W	150	13	150	2
0700	0-45.1	88 03W	160	14	155	3
0800	0 37.5N	88 02W	160	15	160	3
0900	0 31 N	88° W	160	15	160	3
1000	0 31 N	88° W	180	15	180	3
1100	0°31.2N	88°W	180	15	180	3
1200	0°32.5'N	88°02'W	185	15	175	3
1300	0°12'N	88°02'W	160	16	175	3
1400	0°01'S	88°02'W	160	14	175	3
1500	0°12'S	88°05'W	160	13	175	3
1600	"	"	160	13	180	3
1700	0 15S	88 07W	170	13	180	3
1800	0 22S	88 00W	170	15	180	3
1900	0-34S	88 00W	170	15	180	3
2000	0°46.'S	88°060'W	175	15	180	3
2100	0 54S	88 00	175	15	180	3
2200	0 54S	88 00	175	15	180	3
2300	0°54S	88 00	175	12	175	3
2400	1°S	88°W	175	15	180	3

150 all stop

155 8.4 KTS

Date 6 Sept Ship Rockaway (WMEC-37) Cruise No. Eastpac II

Organization USCG Recorder

Sunrise: Time 0547 Position: Lat. , Long.

Sunset: Time 1753 Position: Lat. , Long.

Miles travelled from 0000 hours to sunrise = 45

Miles travelled from sunrise to sunset = 35

Miles travelled from sunset to 2400 hours = 38.7

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	CELESTIAL	2°13.0 S	88°05.0'W
2.	1200	LAN + ☉	2°31'S	88° 02.0'W
3.				
4.	1600	Celestial	3° 45.5'S	88° 01.0'W
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	01° 15.8S	88°-06'W	155	14	170	3
0200	01° 27.5S	88°-06'W	140	15	150	3
0300	01° 39. S	88° 07.5W	150	14.5	160	3
0400	01-44.5S	88 08.2W	150	13	160	3
0500	01-44.5S	88 08.2W	150	13	160	3
0600	01° 54.5S	88° 07.5'W	130	18	160	3
0700	02° 06.5S	88° 05.2'W	130	15	160	3
0800	02 10	88 06	175	15	170	3
0900	02 25 S	88 03 W	175	15	175	3
1000	02 25	88 01	175	15	175	3
1100	02 30	88 00	175	15	175	3
1200	2° 31'S	88° 02'W	160	15	175	3
1300	2° 43'S	88°W	160	14	165	3
1400	2° 46.5'S	88°W	155	14	165	3
1500	3° S	88°W	170	14	175	3
1600	3° 05'S	88° 02'W	170	12	175	3
1700	3° 17'S	88° 02 W	170	12	175	3
1800	3° 25'S	88 03'W	155	16	170	3
1900	3° 39S	88° 00'W	145	16	170	3
2000	3° 45.5S	88 01.0W	145	15	170	1
2100	3 45	88	150	15	150	2
2200	3 45	88	150	15	150	2
2300	3 45	88	150	15	150	2
2400	11	11	145	15	150	2

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SIR 6700

act 20,780 mtrs

Date 7 Sept 1967 Ship Rockaway (WHEC 377) Cruise No. Eastropac 2

Organization United States Coast Guard Recorder

Sunrise: Time 0547 Position: Lat. 4 28.5 Long. 87 56 W

Sunset: Time 1754 Position: Lat. 6 03.5 Long. 8800 W

Miles travelled from 0000 hours to sunrise = 43

Miles travelled from sunrise to sunset = 95

Miles travelled from sunset to 2400 hours = 52.2

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	CELESTIAL	4°52.0'S	87°58.5'W
2.	1200	Lim + Cs	5°11'S	88-12'W
3.				
4.	2000	STARS	6° 19.7 S	87 57.5 W
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	3° 55.5'S	88°W	148	19	—	—
0200	4°47'S	88°02'W	135	19	—	—
0300	4°15'S	88°02'W	135	19	—	—
0400	4-1[illegible]	[illegible]	132	18	140	3
0500	4-21	88W	130	20	140	3
0600	4-35	[illegible]	135	20	140	3
0700	4-02	88 W	135	20	145	3
0800	4 52	87 58.5	130	15	160	3
0900	505	88	130	12	160	4
1000	5 05	88	140	12	160	4
1100	5 05	88	145	12	145	3
1200	5°11'S	88°02.2'W	145	15	150	3
1300	5°20'S	88°02.0'W	145	20	155	3
1400	5°32'S	88°02'W	125	23	140	3
1500	[illegible]	[illegible]	145	21	135	3
1600	[illegible]	88°03 W	136	24	130	3
1700	[illegible]	"	140	20	130	3
1800	6°10 S	"	147	25	130	3
1900	6° 10 S	89°59'W	145	23	130	3
2000	6° 19.7'S	87°57.5'W	145	20	140	4
2100	6 32	87 59	140	20	140	4
2200	6 42	88 00	140	20	140	4
2300	6 42	88 00	140	20	140	4
2400	6° 46 S	88°W	130	15	—	—

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Date 8 Sept 1967 Ship Rockaway (W-377) Cruise No. Eastropac 2

Organization United States Recorder Coast Guard. HA1

Sunrise: Time 0550 Position: Lat. 7 43 S, Long. 88 W

Sunset: Time 1749 Position: Lat. 9°12'S, Long. 88°02'W

Miles travelled from 0000 hours to sunrise = 48

Miles travelled from sunrise to sunset = 98

Miles travelled from sunset to 2400 hours = 58.1

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	CELESTIAL	08°05.5'S	88°01.5'W
2.	1200	LAN + ⊙	8°15.5'S	88°02.7'W
3.	2000	CELESTIAL	9°37.3'S	88°02.0'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	7° 02'S	88°W	135	26	—	—
0200	7° 14'S	88°W	135	25	—	—
0300	7° 26'S	88°W	135	25	—	—
0400	7 28 S	88 W	135	20	125	3
0500	7 32 S	88 W	135	20	125	3
0600	7 44 S	88 W	120	23	125	4
0700	7° 44'S	88°-02.1'W	125	20	125	4
0800	7° 55'S	88°-02.6'W	135	24	130	4
0900	8° 06'S	88°-02.8'W	125	25	130	4
1000	8 07 S	88 03.0W	135	20	130	2
1100	8° 08.5'S	88° 02.1'W	135	20	130	2
1200	8°15.5'S	88°02.7'W	130	19	135	5
1300	8°28'S	88°02.8'W	140	19	135	5
1400	8° 40.5'S	88°02'W	130	20	140	5
1500	8° 53'S	88°02'W	130	18	135	5
1600	8°56'S	88°02'W	130	18	135	4
1700	9°01'S	88°01'W	120	20	135	4
1800	9° 14	88°02'W	120	20	135	4
1900	9°24'S	88°02'W	135	17	135	4
2000	9 37.3 S	88 02.0 W	135	20	120	3
2100	9 42 S	88 W	120	20	100	3
2200	"	"	"	11	120	3
2300	9°49'S	88°W	125	20	125	3
2400	9°56'S	88°W	125	20	—	—

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128
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534

82
32
44

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114
520

Date 9 SEPT 1967 Ship Rockaway (W-377) Cruise No Eastro Pac 2

Organization United States Recorder Coast Guard of America

Sunrise: Time 0550 Position: Lat. 10° 44.5, Long. 88 00 W

Sunset: Time 1746 Position: Lat. _____, Long. _____

Miles travelled from 0000 hours to sunrise = 51 miles

Miles travelled from sunrise to sunset = 83 mi

Miles travelled from sunset to 2400 hours = 38.7

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	2000	Celestial	12 24 S	88 00.7
2.	1200	LAN + ①	11° 17.8'S	87° 58.7'W
3.	0800	CELES. + ELECTRONIC	11° 08.0'S	87° 57.0'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	10° 06'S	88°W	120	26	—	—
0200	10° 20.5S	88°W	"	"	—	—
0300	10° 28'S	88°W	"	"	—	—
0400	10 27.5	88 W	130	20	—	—
0500	10 33.5S	88	120	20	130	2
0600	10 41.5	88	130	20	140	4
0700	10 48	88	125	25	140	4
0800	10 58S	87.58'W	125	20	135	2
0900	11 02.0S	87-58 W	120	15	135	2
1000	11 02.0S	87-58W	120	12	135	2
1100	11° 11.0S	87 58 W	120	20	135	2
1200	11° 17.8'S	87 58.7W	120	20	135	2
1300	11°30.3'S	87°59°W	120	22	130	2
1400	11°42.8'S	88° W	120	22	130	2
1500	11°52'S	88°W	120	19	125	2
1600	11 50 S	88	130	15	130	4
1700	12 05	88	130	15	130	4
1800	12 14	88	130	15	130	4
1900	12 27	88	130	15	130	4
2000	12 24	88 00.7	130	25	130	4
2100	"	"	"	"	"	3
2200	"	"	"	"	"	3
2300	"	"	"	"	"	3
2400	12° 37'S	88°	120	20	—	—

Date 10 SEPT 67 Ship Rockaway (W-37) Cruise No Eastropac 2

Organization United States Coast Guard Recorder United States Coast Guard of America

Sunrise: Time 0548 Position: Lat. 1328, Long. 8800

Sunset: Time 1747 Position: Lat. 1500, Long. 8800

Miles travelled from 0000 hours to sunrise = 48.5 mi.

Miles travelled from sunrise to sunset = 123 mi.

Miles travelled from sunset to 2400 hours = 62.5

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	CELES. & ELECT.	13°43.0'S	88°03.0'W
2.	1200	LAN + ⊙	14° 02.0'S	87°57.0'W
3.	2000	CELES.	15°00.0'S	88°31.0'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	12°49.5'S	88°W	120	22	—	—
0200	13°02.0'S	88°W	130	30	—	—
0300	13°14.5'S	88°W	125	28	—	—
0400	13 24	88	125	25	125	2
0500	13 24	88 00	125	15	125	4
0600	13 30	88 00	125	20	125	4
0700	13 42	88 00	125	20	125	4
0800	13 43	88 03	125	25	125	3
0900	14 00	88 06	125	25	125	3
1000	14°11'	88 06	130	20	125	3
1100	14°11'	88 00	130	20	125	3
1200	14°05	88°W	132	28	130	3
1300	14°20.5'S	88°W	125	28	130	3
1400	14° 33'S	88°W	125	25	130	3
1500	14°45'S	88°W	125	28	130	3
1600	14 47	88	125	25	130	5
1700	14 47	88	125	25	125	5
1800	14 56	88 14	125	25	125	5
1900	15°00'S	88 19	130	25	130	5
2000	14° 57'S	88° 37.2W	130	20	125	4
2100	14° 56'S	88° 42.5W	130	22	129	4
2200	14°57'S	88° 56.1W	130	25	127	4
2300	14° 58'S	89° 07.2W	130	24	135	4
2400	15°S	89°19 W	130	20	130	5

$$\begin{array}{r} 37 \\ 12.5 \\ \hline 49 \end{array}$$

Date 11 SEPT 67 Ship Rebauy (AG-377) Cruise No. Eastropac 2

Organization United States Coast Guard Recorder

Sunrise: Time 0600 Position: Lat. 15°S, Long. 70°35'W

Sunset: Time 1805 Position: Lat. ~~15°58'S~~ 15°S, Long. 72°51'W

Miles travelled from 0000 hours to sunrise = 60.5 miles

Miles travelled from sunrise to sunset = 135.2 miles

Miles travelled from sunset to 2400 hours = 75.3

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	[redacted] ⊙+DR	14°58.0'S	90°52.8'W
2.	1200	LAN+⊙	14°57.0'S	91°39.8'W
3.	2000	CELES.	15°00 S	93° 12' W
4.				
5.				

[redacted]rly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.	
0100	15°S	89°32'W	140	~~25~~	—	—	
0200	15°S	89°43'W	130	28	—	—	
0300	15°S	89°55'W	130	25	—	—	
0400	15°S	90°~~08~~ 10'W	120	30	115	4	
0500	15°	90 22	"	"	"	"	
0600	15°	90 35	"	"	"	"	
0700	15°	90 43	"	"	"	"	
0800	15 S	90 49 W	130	30	145	4	
0900	"	91 04 W	130	30	145	4	
1000	"	91 13 W	125	25	150	5	
1100	"	91 25 W	129	30	150	6	
1200	14°57'S	91°39'W	120	20	~~150~~	~~5~~	SWELL GREAT
1300	14°57'S	91°57'W	120	25	150	5	"
1400	15°S	92°W	115	25	150	5	"
1500	15°S	92°13'W	115	25	145	8	"
1600	15°S	92°23'W	116	25	140	8	"
1700	15°S	92°38'W	125	28	140	8	"
1800	15°S	92°50'W	125	28	140	8	"
1900	15°S	93° 01 W	125	23	140	8	"
2000	15	93 12	125	25	140	7	
2100	15	93 24	125	25	140	7	
2200	15	93 30	125	25	140	7	
2300	15	93 41	125	25	140	7	
2400	15 S	94 W	115	25	140	5	

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Date 12 Sept 67 Ship Rockaway (AW-377) Cruise No. Eastpac 2

Organization United States Coast Guard Recorder ast Guard of America port #1

Sunrise: Time 0619 Position: Lat. 13 15 S, Long. 95°W

Sunset: Time 1816 Position: Lat. 13°09'S, Long. 95°W

Miles travelled from 0000 hours to sunrise = 55.5 miles

Miles travelled from sunrise to sunset = 112.5 miles

Miles travelled from sunset to 2400 hours = 46.9

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	~~MOON~~ ⊙	14°40.5'S	95°03.7'W
2.	1200	LAN + ⊙	14°15.5'S	95°03.7'W
3.	2000	⊙+DR	13°47.0'S	95°05.5'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.	
0100	15°S	94°13'W	125	29	125	2	
0200	15	94°24'W	125	28	125	2	
0300	15	94°37'W	125	28	125	2	
0400	15°S	94°48'W	150	25	140	6	SWELL 20ft
0500	15°S	95°W	"	"	"	"	"
0600	15	95°W	120	25	140	7	"
0700	14°49.5S	95°W	120	25	125	7	"
0800	14 41 S	95 W	"	"	"	"	"
0900	14 28 S	95	095	30	"	"	
1000	14 34 S	95	095	20	"	"	
1100	"	"	"	"	"	"	
1200	14°15.5'S	95°03.7'W	095	25	130	8	SWELL
1300	13°54'S	95°02'W	095	28	130	8	"
1400	13°41.5S	95°02'W	095	28	130	8	"
1500	13°29.0	95°02'W	095	25	130	8	"
1600	13°32'S	95°02'W	100	23	105	7	"
1700	13°28.5	95°W	090	26	105	7	"
1800	13°12'S	95°W	103	25	105	7	"
1900	12°52'S	95°W	103	25	105	7	"
2000	12 47 S	95.05.5W	103	25	105	7	
2100	"	"	"	"	"	"	
2200	"	"	"	30	"	"	
2300	"	"	105	20	"	21	
2400	12° 43'S	"	105	20	NO	8	SWELL

Date 13 SEPT 67 Ship Rockaway (AV-37) Cruise No. Eastropac 2

Organization United States Coast Guard Recorder United States Coast Guard Port #2.

Sunrise: Time 0615 Position: Lat. 10 25'S, Long. 95°W

Sunset: Time 1817 Position: Lat. 09°11', Long. 95°W

Miles travelled from 0000 hours to sunrise = 63 miles

Miles travelled from sunrise to sunset = 137.6 miles

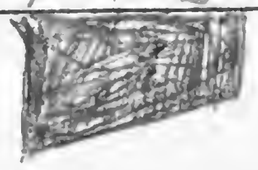
Miles travelled from sunset to 2400 hours = 90

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	STARS + ☉	11° 08.0'S	95° 01.0'W
2.	1200	LAN + ☉	10° 44.8'S	95° 03.0'W
3.	2000	CELES	8° 45.0'S	95° 01.1'W.
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.	
0100	12° 26'S	95°W	095	19	105	3	
0200	12° 11'S	95°W	095	22	105	3	
0300	11° 57'S	95°W	095	22	105	3	
0400	11° 57'	95°W	~~095~~ 083	23	105	6	SWELL
0500	11° 42	95°W	083	22	105	6	"
0600	11° 27'	95°W	083	22	105	6	"
0700	11 19	95°W	095	20	115	6	"
0800	11° 08'S	95° 01.0'W	095	25	~~115~~	6	
0900	11° 08'S	95° 01.0'W	095	20	~~115~~	6	
1000	11° 00'S	95° 01.5'W	085	25	115	5	
1100	10° 51.5	95° 01.5'W	100	15	100	4	
1200	10° 44.8'S	95° 03.0'S	100	15	~~115~~ 100	~~3~~ 2	
1300	10° 29.6'S	95° 03'S	100	15	~~115~~ 100	2	
1400	10° 14.8'S	95° 03'S	095	17	100	2	
1500	10° S	95° 03S	095	15	100	2	
1600	09° 43'S	95° W	120	15	100	2	
1700	9° 30.8'S	95° W	120	12	100	2	
1800	9° 15.5'S	95° W	120	18	100	2	
1900	9° S	95° W	108	~~17~~	095	2	
2000	8° 45 S	95° 02.5'W	115	15	090	2	
2100	8° 30'S	95° 02.W	110	15	—	—	
2200	8° 15'S	95° 02.W	115	15	—	—	
2300	8° 00.	95° 02.W	117	15	—	—	
2400	7° 44'S	95°W	120	15	~~110~~	~~2~~	

26 24 27 2



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Date 14SEPT67 Ship Rockaway (W-37) Cruise No. EastTropac 2

Organization United States Coast Guard Recorder Chief of Mimaica Port #3

Sunrise: Time 0614 Position: Lat. 6°20'S, Long. 95°W

Sunset: Time 1817 Position: Lat. 8°51.2'S Long. 95°W

Miles travelled from 0000 hours to sunrise = 89.6 miles

Miles travelled from sunrise to sunset = 170.7 miles

Miles travelled from sunset to 2400 hours = 47.7

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	DR	6°42.0'S	95°W
2.	1200	LAN + ⊙	7°32.0'S	95°09.0'W
3.	2000	~~DR~~	9°13.0'S	95°W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	7°30'S	95W	120	16	115	2
0200	7°15'S	95W	100	15	115	2
0300	7°S	95W	115	19	115	2
0400	06°42'S	95°W	107	17	105	1
0500	06°29'S	95°W	135	135	110	3
0600	06°20'S	95°W	135	13.5	110	3
0700	6°28'S	95°W	119	25	110	3
0800	6 42'S	95W	110	25	120	4
0900	6 57S	95W	120	18	140	6
1000	7 13S	95W	120	15	140	6
1100	7 28S	95W	120	15	145	5
1200	7°32.0'S	95°W	120	15	130	5
1300	7°47.5'S	95°W	120	23	130	5
1400	8°S	95°W	110	23	130	4
1500	8°12.5'S	95°W	105	24	130	4
1600	8°25.5S	95°W	110	24	120	4
1700	8°37.5	95°W	095	26	110	4
1800	8°47.2	95°W	120	22	105	4
1900	9°00.5'S	95°W	120	24	105	4
2000	9 13.0S	95W	100	20	105	4
2100	9 25.0S	"	100	20	105	4
2200	"	"	110	20	105	4
2300	"	"	110	15	105	3
2400	9°36'S	95°W	115	21	130	3

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Date 15 Sept 67 Ship Rockaway (W-378) Cruise No. Eastropac 2-

Organization United States Coast Guard of America Recorder Port #4

Sunrise: Time 0615 Position: Lat. 10°09.2'S Long. 95°W

Sunset: Time 1817 Position: Lat. 7°55's, Long. 95°W

Miles travelled from 0000 hours to sunrise = 52.5 miles

Miles travelled from sunrise to sunset = 130.7 miles

Miles travelled from sunset to 2400 hours = 15.6

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0500	☆ + ⊙	9°37'S	95°W
2.	1200	LAN + ⊙	8°45'S	95°00.5'W
3.	2000	CELES	7°50.0'S	95°03.0'W
4.				
5.				

Hourly Positions:

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Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	9°46'S	95°W	112	23	130	4
0200	9°58'S	95°W	108	24	130	4
0300	10°11'S	95°W	108	24	120	3
0400	10°12.5'S	95°W	120	29	135	3
0500	10°17.3'S	95°W	120	19	135	3
0600	10°06'S	95°W	120	16	130	3
0700	09°57'S	95°W	120	16	130	3
0800	9-41'S	95 W	120	20	130	4
0900	9-25'S	95 W	120	15	130	4
1000	9-12'S	95 W	100	17	130	3
1100	9-01'S	95 W	100	15	130	3
1200	8°45'S	95°W	112	15	125	2
1300	8°38'S	95°W	130	18	125	3
1400	"	"	105	16	115	2
1500	8°33'S	95°W	105	16	115	2
1600	8°21.3	95°W	110	16	115	3
1700	8°10'S	95°W	120	13	120	3
1800	7°58'S	95°W	108	12	130	3
1900	7°47.5'S	95°W	108	12	125	3
2000	7°50 S	95.2°W	105	10	125	4
2100	"	"	"	"	"	4
2200	"	"	"	"	"	"
2300	7°48'S	95°00 W	"	"	"	"
2400	7°43'S	95°W	110	12	100	2

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Date 16 Sept 67 Ship Rockaway (W-377) Cruise No. Eastropac 2

Organization United States Coast Guard of America Port #5

Sunrise: Time CG19 Position: Lat. 6°44'S, Long. 95°W

Sunset: Time 1817 Position: Lat. _____, Long. _____

Miles travelled from 0000 hours to sunrise = 71.3 Miles

Miles travelled from sunrise to sunset = 97.3

Miles travelled from sunset to 2400 hours = 39.5

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	DR + ⊙	6°28'S	95°03'W
2.	1200	LAN + ⊙	5°50.7'S	95°09.0'W
3.	2000	☆ + DR	4°32.0'S	95°04.5'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	7°32'S	95°W	110	14	—	—
0200	7°19'S	95°W	110	15	—	—
0300	7°07'S	95°W	110	15	—	—
0400	6°56'S	95°W	130	16	—	—
0500	6°56'	95°02'	130	16	—	—
0600	6°45'S	95°W	130	12	—	—
0700	6°33.5'S	95°W	130	12	—	—
0800	6°28'S	95°03'W	130	12	115	2
0900	6°07'S	"	"	"	"	"
1000	6°07'S	"	"	"	"	"
1100	6°07'S	"	"	"	"	"
1200	5°50.7'S	95°09'W	120	15	120	3
1300	5°40.7'S	95°07'W	115	13	120	2
1400	5°28'S	95°05'W	110	14	120	2
1500	5°16'S	95°02'W	120	14	125	2
1600	5°06'S	95°03'W	140	8	135	2
1700	5°06'S	95°03'W	130	12	135	3
1800	4°54'S	95°W	130	16	135	3
1900	4°37.7'S	95-05.5W	130	14	145	2
2000	4°27'S	95°W	120	12	120	2
2100	4°20'S	95°W	125	10	120	2
2200	4°20'S	95°00'W	140	10	120	2
2300	"	"	125	12	120	2
2400	4°15'S	95°03'W	140	15	120	3

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Date 17 Sept 67 Ship Rockaway (AT-377) Cruise No. Eastropac 2

Organization United States Coast Guard Recorder Part #6

Sunrise: Time 0612 Position: Lat. 3°10'S, Long. 95°W

Sunset: Time 1818 Position: Lat. 1°27'S, Long. 95°W

Miles travelled from 0000 hours to sunrise = 486 miles

Miles travelled from sunrise to sunset = 110.1 miles

Miles travelled from sunset to 2400 hours = 268

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0500	✱ + ⊙	2°49S	94°59'W
2.	1200	LAN + ⊙	2°31.1'S	95°01.2'W
3.	2000	CFLES, ELEC.	1°02.0'S	95°00.5'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	4°02.5S	95°02'W	140	15	130	2
0200	3°50'S	95°03'W	140	19	125	2
0300	3°38'S	95°03'W	140	19	125	2
0400	3°34S	95°03'W	135	9	125	1
0500	3°27'S	95°03'W	135	9	125	1
0600	3°12'S	95°W	132	9	125	1
0700	3°S	95°W	172	9	145	1
0800	2°49'S	95°59'W	163	10	145	1
0900	2°40S	95°W	145	10	140	1
1000	2°40S	95°W	125	10	140	1
1100	2°35S	95°00.5W	125	10	140	2
1200	2°31.1'S	95°01.2W	140	14	140	2
1300	2°22'S	95°W	140	14	140	2
1400	2°10'S	95°W	145	14	140	2
1500	1°53'S	95°W	135	14	140	2
1600	1°52'S	95°W	135	13	145	2
1700	1°42'S	95°W	135	13	145	2
1800	1°30'S	95°W	150	10	145	2
1900	1°16'S	95°W	140	10	140	2
2000	1°02.5S	95°00.5W	130	10	135	2
2100	"	"	130	10	135	1
2200	"	"	120	10	135	2
2300	"	"	"	"	"	"
2400	0°57'S	95°W	125	12	135	2

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Date 18 Sept 67 Ship Rockaway (WHEC-377) Cruise No. Eastpac 2

Organization United States Coast Guard of America Recorder Port #7

Sunrise: Time 0612 Position: Lat. 0°21'S, Long. 95°W

Sunset: Time 1818 Position: Lat. 1°11'N, Long. 95°W

Miles travelled from 0000 hours to sunrise = 32.6 miles

Miles travelled from sunrise to sunset = 87.3 miles

Miles travelled from sunset to 2400 hours = 51.7

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	[redacted]	[redacted]		
2.	0400	☆ +DR	0°04.0'S	95°05.0'W
3.	1200	LAN + ⊙	0°23.0'N	95°06.3'W
4.	2000	CELES	1°32.0'N	95°00.0'W
5.				

Hourly Positions→

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	0°57'S	95°W	120	5	135	2
0200	0°53.5'S	95°W	120	8	135	2
0300	0°40.6'S	95°W	130	13	135	2
0400	0°23'S	95°W	170	8	145	2
0500	0°21'S	95°W	170	8	170	2
0600	0°21'S	95°W	~~170~~ 155	11	170	2
0700	0°15.5'S	95°W	150	12	170	1
0800	0-04 S	95-05W	170	10	175	1
0900	0 09 S	95 00W	"	"	"	1
1000	0 BG N	95 00W	"	"	"	1
1100	0 23 N	95 00	"	"	"	1
1200	0°23.0'N	95°06.3'W	150	14	170	1
1300	0°26.0'N	95°W	155	13	150	1
1400	0°37.5'N	95°W	150	13	150	1
1500	0°47'N	95°W	155	8	150	1
1600	0°57'N	95°W	160	8	180	1
1700	1°10'N	95°W	155	8	180	1
1800	1°10'N	95°W	155	8	180	1
1900	0°21'N	95°W	155	8	180	1
2000	1 32 N	95 W	155	10	"	"
2100	1 55 N	95 W	"	"	"	"
2200	"	"	CALM		"	"
2300	"	"	155	10	"	"
2400	1°56'N	95°W	180	8	180	2

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Date 19 Sept 67 Ship Rockaway (W-377) Cruise No. Eastpac 2

Organization United States Coast Guard Recorder Coast Guard of America part #8

Sunrise: Time 0611 Position: Lat. 2° 50'S, Long. 95°W

Sunset: Time 1817 Position: Lat. 4° 25'N, Long. 95°W

Miles travelled from 0000 hours to sunrise = 61.5 miles

Miles travelled from sunrise to sunset = 130 miles

Miles travelled from sunset to 2400 hours = 34.5

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	LAN+Q	3°03'N	94°43'W
2.	1200	LAN+Q	3°25'N	94°46'W
3.	2000	Q+DR	4°43.5'N	94°59'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	2° 47'N	95°W	180	8	180	1
0200	2° 17.5N	95°W	180	14	180	1
0300	2° 28'N	95°W	200	13	180	1
0400	2° 40'N	95°W	185	13	180	2
0500	2° 40'N	95°W	195	10	180	2
0600	2° 48.5'N	95°W	216	13	185	2
0700	3° 02'N	95°W	210	13	195	1
0800	3 09 N	95 W	"	10	200	1
0900	3 25 N	95 W	200	10	200	2
1000	"	"	"	"	200	2
1100	"	"	"	"	"	"
1200	3°25.0'N	94°46.0'W	205	13	195	2
1300	3°37.5'N	94°51.5'W	195	14	195	1
1400	3° 48.1'N	94°55'W	195	14	195	1
1500	3° 58'N	94°58'W	200	17	195	2
1600	3° 59'N	95°W	232	16	185	1
1700	4° 12'N	95°W	205	16	190	1
1800	4° 21'N	95°W	205	16	190	1
1900	4° 34'N	95°W	230	15	180	1
2000	4° 43.5'N	94°59'W	190	15	"	"
2100	"	"	"	"	"	"
2200	"	"	"	"	"	"
2300	"	"	"	"	"	"
2400	4° 47'N	95°W	"	14	"	"

958b-SI-MNH
Rev. 9/28/66

Date 20 Sept 67 Ship Rockaway (WAK) 37 Cruise No. Eastpac 7

Organization United States Coast Guard Recorder port # 9

Sunrise: Time 0610 Position: Lat. 5°41'N, Long. 95°W

Sunset: Time 1818 Position: Lat. 7°35'N, Long. 95°W

Miles travelled from 0000 hours to sunrise = 47.7 miles

Miles travelled from sunrise to sunset = 125.8 miles 23

Miles travelled from sunset to 2400 hours = 90.7

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	~~0714~~		6°14.2'N	94°51'W
2.	0800			
3.	1200		6°34.0'N	94°52'W
4.	2000	ELEC	8°07.0'N	94°58.0'W
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	4°58.5'N	95°W	190	13	190	1
0200	5°12'N	95°W	225	9	190	1
0300	5°25'N	95°W	220	5	190	1
0400	5°34'N	95°W	200	10	190	1
0500	5°34'N	95°W	200	8	195	1
0600	5°39.8	95°W	200	15	195	1
0700	5°53'N	95°W	230	10	200	1
0800	6 14.7N	94 51.0W	258	17	190	1
0900	6 28 N	94 52 W	261	14	200	1
1000	"	"	"	13	"	"
1100	"	"	"	14	240	1
1200	6°34'N	94°52'W	281	15	260	1
1300	6°34'N	94°54'W	270	9	260	1
1400	6°52.3'N	94°56'W	265	5	250	1
1500	7°05.6'N	94°56'W	250	5	300	1
1600	7°14'N	94°59'W	250	4	3290	1
1700	7°19'N	95°W	245	10	295	1
1800	7°31'N	95°W	240	10	270	1
1900	7°44'N	95°W	240	10	270	1
2000	8 07.0N	94 48 W	240	4	270	1
2100	804 N	9500 W	"	"	"	"
2200	"	"	CALM		"	"
2300	805 N	9500 W	305	4	265	1
2400	8°21'N	95°W			260	1

1
34
13.3
52.3
65.3
5.0

Date 21 Sept 67 Ship Rockaway (W-377) Cruise No Eastpac 2

Organization USCG Recorder

Sunrise: Time 0609 Position: Lat. 9°21'N, Long. 95°W

Sunset: Time 1816 Position: Lat. 11°23'N Long. 95°W

Miles travelled from 0000 hours to sunrise = 60.0 miles

Miles travelled from sunrise to sunset = 110.4 miles

Miles travelled from sunset to 2400 hours = 15.3

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0000	DR	10-02'N	95-02'W
2.	~~10-21.0'~~			
3.	1200	CELES	10° 21.0'N	95° 03.5'W
4.	2000	CELES	11° 37.0'N	95° 01.5'W
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	8° 54'N	95°W	355	5	260	1
0200	8° 47'N	95°W	000	7	260	1
0300	8° 54'N	95°W	080	8	260	1
0400	8° 56'N	95°W	000	7	260	1
0500	9° 02'N	95°W	000	7	260	1
0600	9° 19'N	95°W	310	3	230	1
0700	9° 32'N	95° W	288	12	270	1
0800	1002N	9502W	280	10	280	2
0900	"	"	270	12	"	"
1000	1049N	95 W	370	11	"	"
1100	1015 N	95 W	314	15	"	"
1200	10° 21.0'N	95°W	310	14	300	2
1300	10° 34' N	95°W	310	13	300	2
1400	10° 47' N	95°W	310	3	300	2
1500	10° 48.5N	95°W	310	3	300	2
1600	10° 50'N	95°W	315	8	315	2
1700	11° 03'N	95°W	040	8	285	3
1800	11°20'N	95°W	080	8	295	3
1900	~~11 37N~~	~~95 01W~~	150	5	~~295~~	~~3~~
2000	11 37N	9501W	150	5	295	3
2100	"	"	"	"	270	"
2200	"	"	"	"	265	3
2300	"	"	"	7	265	2
2400	11°51'N	95°W	160	6	310	2

Eagle

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ALT @ 8,900

Date 22 Sept 67 Ship Rockaway (W-377) Cruise No. Eastpac 2

Organization USCG Recorder

Sunrise: Time 0609 Position: Lat. 12°42'N Long. 95°W

Sunset: Time 1810 Position: Lat. 14°90'S, Long. 95°W

Miles travelled from 0000 hours to sunrise = 48.3 miles

Miles travelled from sunrise to sunset = 128.7 miles

Miles travelled from sunset to 2400 hours = 52.2

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	CELES	13°15.6'N	95°01.5'W
2.	1200	LAN + Ø	13°33.5'N	95°00.5'W
3.	2000	CELES.	15°00.0'N	94°59.5'W
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	11°54'N	95°W	225	7	260	2
0200	12°08'N	95°W	225	7	265	2
0300	12°20.5'N	95°W	195	4	265	2
0400	12°29'N	95°W	200	5	270	3
0500	12°29'N	95°W	230	5	300	3
0600	12°40'N	95°W	230	4	275	3
0700	12°39.2'N	95°W	230	4	260	3
0800	13°15.6'N	95°01'W	230	4	260	3
0900	13°19'N	"	170	8	"	"
1000	"	"	"	"	"	2
1100	13°24'N	"	"	7	"	3
1200	13°33.5'N	95°00.5'W	160	6	260	2
1300	13°46.5'N	95°W	160	6	260	2
1400	13°56.5'N	95°W	165	18	240	2
1500	14°09'N	95°W	185	10	242	2
1600	14°13'N	95°W	213	11	230	2
1700	14°24.8'N	95°W	190	7	215	1
1800	14°38.5'N	95°W	205	8	245	2
1900	14°51.5	95°W	235	8	245	2
2000	15°00.0'N	94°59.5'W	220	9	245	2
2100	~~15°5'~~	~~94°55'W~~	"	"	"	"
2200	14°58'N	94°55'W	220	3	245	2
2300	14°58'N	94°41	195	8	"	"
2400	14°48'N	94°26'W	235	7	245	2

8:18

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Date 23 SEPT 67 Ship Rockaway (W-377) Cruise No. Eastpac 2

Organization USCG Recorder

Sunrise: Time 0601 Position: Lat. 14° 20.5'N Long. 92° 56'W

Sunset: Time 1816 Position: Lat. 13° 29'N Long. 90° 20'W

Miles travelled from 0000 hours to sunrise = 90° miles

Miles travelled from sunrise to sunset = 158.2 miles

Miles travelled from sunset to 2400 hours = 77.0

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	ELEC & CELES	14°12.5'N	92° 29.3'W
2.	1200	LAN + Q + R RANGE	13°54.3'N	91° 35.0'W
3.	2000	ELEC	13° 23.8'N	89° 55.0'W
4.				
5.				

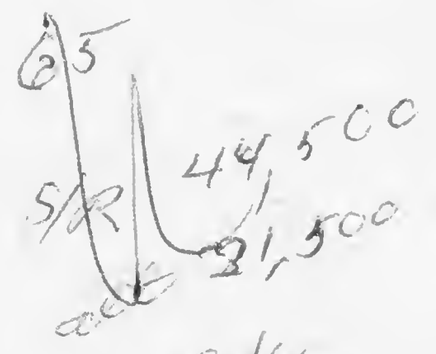
Hourly Positions: YEH

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	14°43.7'N	94°11'W	215	7	220	2
0200	14°39.2'N	93°56.6'W	215	7	220	2
0300	14°34.8'N	93°42'W	340	7	220	2
0400	14° 30'N	93° 27	290	6	225	2
0500	14° 25	93° 12.5	325	26	225	2
0600	14° 20.5	92° 58	325	25 15	220	2
0700	14° 16'N	92° 44	325	15	220	2
0800	14 12.5N	92 29.3W	135	17	11	3
0900	14 08.5N	92 15 W	CALM		170	2
1000	14 02.5N	92 00.5W	134	7	176	3
1100	13 58 N	91 45 W	000	5	185	3
1200	13°54.3'N	91° 35.0'W	108	3	200	1
1300	13°50.7'N	91° 22.6'W	200	9	200	1
1400	13°46.8'N	91° 10.4'W	200	10	200	1
1500	13°42.7'N	90°58.0'W	200	10	200	1
1600	90 45	1390'	205	10	290	1
1700	13°37.4'N	90° 09.0'W	205	10	170	1
1800	13° 31'N	90° 22'W	205	10	175	1
1900	13°27.5	90°09.5'	290	3	190	1
2000	13 23.8N	89 55 W	"	4	180	1
2100	13 20.3N	89 42 W	300	2	"	"
2200	13 16.9N	89 29.7W	310	2	"	"
2300	13 13.3N	89 17.0W	"	9	"	"
2400	13°10.1'N	89 05.4'W	040	11	180	1

F
143

CPA
~~NEC~~
75000
15 KTS

~~034 24,000 yds~~
072 11,500 yds



13° 10° N

8901

Date 24SEPT67 Ship Rockaway (WHEC 377) Cruise No. Eastpac 2

Organization USCG Recorder _____

Sunrise: Time 0541 Position: Lat. 13°04'N Long. 87°57'W

Sunset: Time 1747 Position: Lat. —, Long. —

Miles travelled from 0000 hours to sunrise = 75 Miles

Miles travelled from sunrise to sunset = —

Miles travelled from sunset to 2400 hours = —

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	ELEC, VISUAL	13° 20.3'N	87°49.2'W
2.				
3.				
4.				
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	13°06.8'N	85°52.9'W	075	12	180	1
0200	13°03.2'N	88°40.5'W	075	12	180	1
0300	13° N	88°27.5'W	085	12	195	1
0400	13°01'N	88°09'	090	12	195	1
0500	13°02'N	88°05.3W	028	10	120	1
0600	13°07'N	87°51'W	028	10	120	1
0700	13°15'N	87°47.5'W	030	10	045	½
0800						
0900						
1000						
1100						
1200						
1300						
1400						
1500						
1600						
1700						
1800						
1900						
2000						
2100						
2200						
2300						
2400						

WAVE

ANCHORED OFF LA UNION EL SALVADOR

Date 27 Sept 67 Ship Rockaway (WHEC) 377 Cruise No. _____

Organization _____ Recorder _____

Sunrise: Time 0540 Position: Lat. _____, Long. _____

Sunset: Time 1740 Position: Lat. _____, Long. _____

Miles travelled from 0000 hours to sunrise = _____

Miles travelled from sunrise to sunset = _____

Miles travelled from sunset to 2400 hours = 103.3 miles

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	1200	①	12°08.5'N	87°17.0'W
2.	0800	VIS	13° 08.5'N	87° 46.6'W
3. ~~12~~				
4.	2000	elect.	10 20.6 N	86 09 W
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100						
0200						
0300						
0400						
0500			ANCHORED		OFF	
0600			LA	UNION	, EL SALVADOR	
0700						
0800	13 05	87 46				
0900	12 47.7	87 45	CALM	—	CALM	—
1000	12 39	87 36	"	—	—	—
1100	12 25.5	87 21	"	—	—	—
1200	12° 08.5'N	87° 17'W	CALM	—	260	1
1300	11° 57.5'	87° 08'W	"	—	300	1
1400	11° 44 N	86° 58'W	"	—	285	1
1500	11° 30' N	86° 50'W	"	—	255	1
1600	11 19 N	86 42 W	"	—	265	1
1700	11° 07'N	86° 34'W	"	—	265	1
1800	10 50 N	86 22 W	"	—	265	1
1900	10 38.3 N	86 16 W	"	—	265	1
2000	10 20.6 N	86 09 W	087	15	—	—
2100	10 01 N	85 55 W	090	15	—	—
2200	09 54 N	85 51.5 W	093	20	—	—
2300	09 40 N	85 41 W	093	20	—	—
2400	09 34' N	85° 28.5	210	10	180	1

all one

Date Sept 28 1969 Ship Rockaway (WHEC-37) Cruise No. _____

Organization U.S.C.G. Recorder _____

Sunrise: Time 0525 Position: Lat. 9°40 N, Long. 84°12 W

Sunset: Time 1719 Position: Lat. 7°05 N, Long. 81°39 W

Miles travelled from 0000 hours to sunrise = 91.7

Miles travelled from sunrise to sunset = 199

Miles travelled from sunset to 2400 hours = 105.2 miles

	TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.	0800	VIS & ELEC	8°16.5'N	83°47.2'W
2.	1200	VIS & ELEC	7°36.2'N	82°51.5'W
3.				
4.	2000	Radar	7 03.5	80 45.7
5.				

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	7°23'N	85°12.5	210	10	185	1
0200	7°14'N	84°58.5	205	10	185	1
0300	7°05'N	84°46'W	025	6	155	1
0400	6 55 N	84 32 W	220	12	155	2
0500	8 45 N	84 19 W	185	12	155	1
0600	8 35 N	84 05 W	099	24	155	2
0700	8 25 N	83 52 W	099	24	155	1
0800	8 16.5	83 47.2	113	15	155	1
0900	8 07	83 33	140	11	155	1
1000	7 57	83 20	140	11	155	1
1100	7 47.5	83 09.5	053	10	165	1
1200	7°36.2'	82°51.5'	210	6	150	1
1300	7°26'N	82°38	"	"	"	"
1400	7°20'N	82°23	"	"	"	3
1500	7°15'N	82°12	210	14	225	3
1600	7 07 N	81 53 W	212	15	11	"
1700	7 05 N	81 36 W	214	14	"	"
1800	7 05 N	81 20 W	240	10	"	"
1900	7 05 N	81 04 W	245	10	"	"
2000	7 03.5	80 45.7	253	10	"	4
2100	7 03.5	80 28.5	253	16	"	"
2200	7 8.5	80 14	250	16	"	"
2300	7 15	80 00	250	16	"	"
2400	7°24'N	79°55'	215	15	240	2

Wave
11
"

14.6
5.3
830
830
91.30

14.6
15
370
166
1936

Date 29 Sept 1967 Ship Rockaway (WHEC-27) Cruise No. _____

Organization U.S.C.G. Recorder _____

Sunrise: Time 0509 Position: Lat. _____, Long. _____

Sunset: Time _____ Position: Lat. _____, Long. _____

Miles travelled from 0000 hours to sunrise = 62 mi

Miles travelled from sunrise to sunset = —

Miles travelled from sunset to 2400 hours = —

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.	MOORED RODMAN NAVAL BASE		
3.	PANAMA CANAL ZONE		
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	7° 40	79° 50	220	15	240	2
0200	7° 56.5	79° 45' W	200	6	230	2
0300	8° 14' N	79° 39' W	265	7	230	2
0400	8 29 N	79 24 W	200	8	230	1
0500						
0600						
0700			OFF PANAMA	CANAL		
0800						
0900						
1000						
1100						
1200		MOORED	RODMAN NAVAL	BASE		
1300			PANAMA C.Z.			
1400						
1500						
1600						
1700						
1800						
1900						
2000						
2100						
2200						
2300						
2400						

Date Sept 30 1969 Ship Rockaway (____) Cruise No. ____

Organization USCG Recorder ____

Sunrise: Time 0609 Position: Lat. 9°39'N, Long. 79°43'W

Sunset: Time ____ Position: Lat. ____, Long. ____

Miles travelled from 0000 hours to sunrise = ____

Miles travelled from sunrise to sunset = ____

Miles travelled from sunset to 2400 hours = ____

TIME OF FIX	TYPE OF FIX	LATITUDE	LONGITUDE
1.			
2.			
3.			
4.			
5.			

Hourly Positions:

Time	Latitude	Longitude	Wind Dir.	Wind Sp.	Wave Dir.	Wave Hgt.
0100	~~9°41'N~~	~~79°46~~	~~050~~	~~9~~	~~030~~	~~1~~
0200						
0300						
0400						
0500	9°27'N	79°54'	045	9	030	1
0600	9°41'N	79°46	050	9	050	1
0700	9°57'N	79°37				
0800						
0900						
1000						
1100						
1200						
1300						
1400						
1500						
1600						
1700						
1800						
1900						
2000						
2100						
2200						
2300						
2400						

4

15.7

5-9

9.8

PHYSICAL OCEANOGRAPHIC DATA
NOON (L.A.N.) STATION POSITIONS
EASTROPAC - USCGC ROCKAWAY
AUGUST 1967

DATE.	STATION	ON STATION TIME (LOCAL)	LAT.	LONG	SECCHI DEPTH (METERS)	SURFACE OCEANOGRAPHIC DATA TEMP (°C)	SALINITY (PPT) ‰	LAYER DEPTH (METERS)
1	PANAMA	—	—	—	—	—	—	—
2	47011	1014	06-50N	079-16W	30	27.40	31.154	0 (NONE)
3	47025	1108	05-41N	080-31W	25	26.60	31.971	38
4	47034	0910	03-19N	079-44W	19.8	26.18	33.155	36
5	47049	1435	01-00N	082-00W	22	25.00	33.925	30
6	47061	0900	01-11S	082-02W	11	23.90	33.414	15
7-9	GUAYAQUIL, ECUADOR	—	—	—	—	—	—	—
10	47078	0920	04-39S	082-03W	8	19.79	34.825	0
11	47094	0900	07-28S	081-57W	23	18.11	35.187	44
12	47103	0900	10-09S	082-09W	22	17.95	35.254	42
13	47113	0900	09-22S	079-39W	15	16.10	35.044	44
14-16	CALLAO, PERU	—	—	—	—	—	—	—
17	47134	0900	12-56S	079-28W	20	16.47	35.209	0
18	47143	0856	13-58S	082-25W	23	17.41	35.300	43
19	47151	0800	14-56S	085-00W	19	17.84	35.355	0
20	47159	0830	12-07S	084-59W	19	17.80	35.306	0
21	47168	0835	09-17S	085-07W	22	18.71	35.315	50
22	47177	0808	06-35S	085-09W	17	17.95	35.092	0
23	47189	0900	03-51S	085-01W	12	18.40	35.037	0
24	47205	0900	00-40S	085-04W	21	23.43	34.270	20
25	47221	0900	02-08N	084-57W	25	25.89	33952	28
26	47237	0900	05-07N	084-45W	11	26.71	31.963	15
27	47246	0950	07-43N	085-04W	11	27.38	34.029	0
28 30	PUNTARENAS, COSTA RICA	—	—	—	—	—	—	—
31	47268	0935	11-58N	088-02W	25	27.80	33.049	0

PHYSICAL OCEANOGRAPHIC DATA
NOON (L.A.N.) STATIONS - EASTROPAC
USCGC ROCKAWAY
SEPTEMBER 1967

DATE	STATION	ON STATION TIME	LAT	LONG.	SECCHI DEPTH (METERS)	SURFACE TEMP (°C)	OCEANOGRAPHIC SALINITY (PPT) ‰	DATA LAYER DEPTH (M)
1	47280	0955	09-45N	88-14W	9	26.19	34.095	NONE
2	47290	1010	06-47N	87-57W	17	26.74	32.835	15
3	COCOS ISLAND							
4	47304	0915	03-22N	88-04W	30	26.20	33.539	28
5	47318	0940	00-34N	88-02W	28	23.64	34.842	20
6	47334	0950	02-24S	88-02W	14	18.50	34.860	20
7	47349	0940	05-10S	88-02W	20	18.58	35.250	55
8	47359	0915	08-07S	88-03W	20	19.01	35.262	20
9	47369	0830	11-02S	87-58W	23	18.19	35.342	68
10	47379	0927	13-57S	87-57W	23	1860	35.462	75
11	TRANSIT LEG							
12	47404	0952	14-17S	95-03W	23	20.09	35.691	100
13	47415	0755	11-07S	95-02W	23	20.56	35.451	91
14	RENDEZVOUS WITH SOMERSET							
15	47436	1300	08-32S	95-02W	35	20.99	35.331	78
16	47443	0915	05-55S	95-08W	28	20.69	35.256	63
17	47458	0825	02-41S	95-00W	24	18.51	35.029	NONE
18	47474	1030	00-23N	95-07W	21	22.61	34.470	6
19	47490	0904	03-16N	94-41W	34	25.80	33.725	32
20	47504	0925	06-27N	94-59W	19	26.60	33.602	NONE
21	47513	0755	09-49N	95-05W	17	25.99	33.652	NONE
22	47523	0818	13-16N	95-01W	21	27.89	33.264	7

EASTROPAC - CGC ROCKAWAY
AUGUST - SEPTEMBER 1967
TOTAL # BIRDS BY SPECIES BY AREA

	AREA 1	2	3	4	5	TOTAL #/SPECIES
BROWN BOOBY	30	40	306	0	38	414
RED FOOTED BOOBY	0	0	1040	0	63	1103
BLUE FACED BOOBY	1	0	1	1	57	60
PERUVIAN BOOBY	0	6	0	0	0	6
UNID. BOOBY	0	0	2	1	1	4
LEACH'S STORM PETREL	66	144	302	75	49	636
WILSON'S STORM PETREL	10	292	0	0	0	302
LEACH'S or WILSON'S S. P.	25	67	167	0	0	259
WHITE BELLY STORM PETREL	0	8	0	0	0	8
GALAPAGOES STORM PETREL	1	1	0	0	0	2
SOOTY STORM PETREL	2	9	40	4	2	57
WHITE THROATED ~~BELLY~~ STORM PETREL	0	0	0	1	0	1
HORNBY'S STORM PETREL	0	8	0	9	3	20
SOOTY or BULWER'S S. P.	0	3	0	4	0	7
UNID STORM PETREL	1	0	1	0	1	3
COOK PETREL	0	1	0	0	0	1
UNID. GADFLY PETREL	0	14	0	3	0	17
CAPE PIGEON; PINTADO PETREL	0	105	0	16	0	121
GREAT FRIGATE BIRD	15	1	1010	0	0	1026
LESSER FRIGATE BIRD	0	1	0	0	0	1
UNID FRIGATE BIRD	0	76	37	2	141	256
COMMON NODDY	0	0	50	0	0	50
FAIRY TERN	0	0	50	0	0	50
ROYAL?; CASPIAN?; CRESTED? TERN	0	0	0	1	0	1
UNID. TERN	1	22	0	0	14	37
UNID. TROPIC BIRD	0	1	0	0	0	1
BROWN? PELICAN	0	20	0	0	203	223
UNID GULL ~~SHILLEAD PELICAN~~	0	0	0	2	0	2
KITTYWAKE GULL	0	35	0	0	0	35
FRANKLIN'S GULL	0	120	0	0	0	120
SOOTY SHEARWATER	0	~~24~~ 96	0	0	0	~~24~~ 96
WEDGETAIL? SHEARWATER	0	5	2	3	2	12
~~DARK~~ NEWELL'S SHEARWATER	0	0	0	0	42	42
UNID SHEARWATER	0	0	0	0	4	4
FULMER (UNID)	0	1	0	0	0	1
UNID. ALBATROSS	0	3	0	0	0	3
NORTHERN PHALAROPE	0	9	5	7	100	121
PARASITIC? JAEGER	0	0	15	0	0	15
UNID JAEGER	0	0	10	0	0	10

EASTROPAC - CGC ROCKAWAY
AUGUST - SEPTEMBER 1967
TOTAL # BIRDS BY SPECIES BY AREA

	AREA 1	2	3	4	5	TOTAL #/SPECIES
SNOWY EGRET	0	0	1	0	0	1
WHITE EGRET (UNID)	0	15	0	0	0	15
SANDPIPER or SANDERLING	0	0	3	0	0	3
UNID. SANDPIPER	0	0	0	0	1	1
DUNLIN	0	0	0	0	2	2
WHIMBREL	0	0	1	0	0	1
UNID SEABIRD	0	3	0	0	0	3
CLIFF SWALLOW	0	0	3	0	0	3
UNID FLYCATCHERS	0	0	1	0	0	1
UNID WOOD PEWEE or PHOEBE	0	0	3	0	0	3
EASTERN KINGBIRD	0	0	0	0	2	2
UNID WARBLERS	0	0	0	0	1	1
UNID DUCKS	0	0	0	0	8	8
TOTAL # BIRDS/AREA	151	1106	3050	129	734	5170

TOTAL # BIRDS SEEN DURING SURVEY

AREA 1 EASTROPAC - CGC ROCKAWAY
AUG 1 - AUG 5 1967

	AUG 1	2	3	4	5	TOTAL NO/SPECIES/AREA
BROWN BOOBY	30					30
BLUE FACED BOOBY				1		1
LEACH'S STORM PETREL	5		20	17	24	66
WILSON'S STORM PETREL	10					10
WILSON'S OR LEACH'S SP?				25		25
GALAPAGOES STORM PETREL					1	1
SOOTY STORM PETREL					2	2
UNID. STORM PETREL					1	1
GREAT FRIGATE BIRD	15					15
UNID. TERN				1		1
TOTAL NO. BIRDS OBS/DAY	60	0	20	44	28	152 TOTAL # BIRDS AREA

AREA 2 EASTROPAC - CGC ROCKAWAY
6-24 AUG 1967

	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL #/SPECIES
BROWN BOOBY		15			15			10												40
PERUVIAN BOOBY ~~BLUE FACED BOOBY~~					5						1									6
LEACH'S STORM PETREL	15	25											1		33	26	15	25	4	144
WILSON'S STORM PETREL					202			15			30	25	2	1	1	1		15		292
WILSON'S or LEACH'S S.P.						40	10							1				15	1	67
WHITE BELLY STORM PETREL														2	1	1	4			8
GALAPAGOES STORM PETREL					1															1
SOOTY STORM PETREL	2				2									1	2			2		9
HORNBY'S STORM PETREL					1		3									1		3		8
BULWER'S or SOOTY S.P.													1	1			1			3
COOK PETREL								1												1
UNID GADFLY PETREL					2	10	2													14
GREAT FRIGATE BIRD																			1	1
LESSER FRIGATE BIRD																			1	1
UNID. FRIGATE BIRD		75																	1	76
UNID. TERN					2						20									22
UNID TROPIC BIRD	1																			1
CAPE PIGEON (PINTADO PETREL)		20			30	15	5				5	3	1	5	1	10	4	6		105
BROWN? PELICANS		20																		20
KITTYWAKE GULL											35									35
FRANKLIN'S GULL		100									20									120
UNID. WHITE EGRET		15																		15
WEDGETAIL SHEARWATER												5								5
SOOTY SHEARWATER								6			90	X								96
FULMER											1									1
ALBATROSS (UNID.)							1									2	1			3
NORTHERN PHALAROPE																	9			9
UNID. SEA BIRD							2	1												3
TOTAL NO. BIRDS OBS/DAY	18	270	0	0	260	65	22	33	0	0	202	33	5	11	38	41	24	76	8	1106

TOTAL # BIRDS / AREA

AREA 3 EASTROPAC - CGC ROCKAWAY
25 AUG - 5 SEPT 1967

	AUG 25	26	27	28	29	30	31	SEPT 1	2	3	4	5			TOTAL # SPECIES PER AREA
BROWN BOOBY			5						1	300					306
RED FOOTED BOOBY	8							9	2	1000	20	1			1040
UNID. BOOBY			2												2
BLUE FACED BOOBY								1							1
LEACH'S STORM PETREL	6	10	225				2	50	5		2	2			302
WILSON'S, LEACH'S STORM PETREL			2	150				15							167
~~WHITE BELLY~~ SOOTY STORM P.							25	12	2		1				40
UNID STORM PETREL	1														1
GREAT FRIGATE BIRDS										1010					1010
UNID FRIGATE BIRDS	23	1									13				37
COMMON NODDY TERN										50					50
FAIRY TERN					1					50					50
WEDGETAIL? ~~SOOTY~~ SHEARWATER											1	1			2
NORTHERN PHALAROPE							4	1							5
~~PARASITIC~~? JAEGER											15				15
UNID. JAEGER											10				10
SNOWY EGRET			1												1
SANDERLING or SANDPIPER			1							2					3
WHIMBREL										1					1
CLIFF SWALLOW									3						3
FLYCATCHER								1							1
PHOEBE or WOOD PEEWEE							3								3
TOTAL NO. BIRDS/DAY	38	11	236	150	0	0	34	89	13	2413	62	4			3050 TOTAL # BIRDS/AREA

AREA 4 EASTROPAC - CGC ROCKAWAY
6 - 18 SEPTEMBER 1967

	6	7	8	9	10	11	12	13	14	15	16	17	18			TOTAL # SPECIES PER AREA
BLUE FACED BOOBY							1									1
UNID. BOOBY												1				1
LEACH'S STORM PETREL	1	21	21							1	10	11	10			75
WHITE THROATED STORM P. LEACH'S & WILSON'S S.P.						1										1
SOOTY STORM PETREL	1	1										2				4
HORNBY'S STORM PETREL		3	1	1						1	3					9
BULLER'S & SOOTY S.P.				1	1			1		1						4
UNID. GADFLY PETREL													3			3
UNID. FRIGATE BIRD									1		1					2
ROYAL, CASPIAN, & CRESTED TERN													1			1
CAPE PIGEON & PINTADO PETREL	1	3	2	2	1		2	2		1	0	2				16
UNID. GULL												1	1			2
WEDGETAIL? SOOTY SHEARWATER	1								1		1					3
NORTHERN PHALAROPE	4											3				7
TOTAL NO. BIRDS / DAY	8	28	24	4	2	1	3	3	2	4	15	20	15			129

TOTAL # BIRDS / AREA

ZONE 1 ZONE 2 ZONE 3 ZONE 4

ZONE 1 47001-47054 47055-47209 47210-47321 47322-47416
AUG 1 - AUG 5 6 AUG - 24 AUG 25 AUG - Sept 5 6 SEPT - 18 SEPT

ZONE 5
47417 - 47534
19 SEPT - 28 SEPT 67

AREA 5 EASTROPAC - CGC ROCKAWAY
19-30 SEPTEMBER 1967

	19	20	21	22	23	24	25	26	27	28	29	30	TOTAL NO/SPECIES/AREA
BROWN BOOBY			1	20	5				10	2			38
RED FOOTED BOOBY	61		2										63
BLUE FACED BOOBY			3	16	37				1				57
UNID BOOBY				1									1
LEACH'S STORM PETREL	12	7	29	1									49
SOOTY STORM PETREL			2										2
HORNBY'S STORM PETREL	1	2											3
UNID. STORM PETREL				1									1
~~UNID. GADFLY PETREL~~													
UNID. FRIGATE BIRDS	100	1			10	15			15				141
~~BOOBY, BROWN, RED FOOTED TERN~~													
UNID TERN		1	2		10				1				14
BROWN ? PELICAN						3			200				203
UNID. SHEARWATER	2	2											4
NEWELLS SHEARWATER					10					32			42
WEDGETAIL SHEARWATER	2												2
NORTHERN PHALAROPE			20	45	35								100
UNID SANDPIPER				1									1
DUNLIN SANDPIPER				1	1								2
DUCKS (UNID.)										8			8
UNID. WARBLER		1											1
EASTERN KINGBIRD			2										2
TOTAL NO. BIRDS/DAY	~~176~~ 178	14	61	86	108	18	0	0	227	42			~~732~~ 734 TOTAL # BIRDS/AREA

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TURTLES & MAMMALS OBSERVED - EASTROPAC - CGC ROCKAWAY
AUGUST - SEPTEMBER 1967

	AUG 9	AUG 10	AUG 27	AUG 28	SEPT 1	SEPT 9	SEPT 22	SEPT 23	SEPT 27	TOTAL #/SPECIES
GREEN TURTLES			2		8		1		8	19
PILOT WHALES		1000				20				1020
SPOTTED DOLPHINS				2				20		22
WHITE BELLIED DOLPHIN								1		1
UNID. DOLPHIN	25							1		26
TOTAL NO. MAMMALS/DAY	25	1000		2		20		22		1069 TOTAL # MAMMALS SEEN DURING SURVEY